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GEDDES, JOHN, M.D., L.R.C.S. Edin., 37, Union-place, Aberdeen.
GEORGE, FREDERICK, M.D., M.R.C.S. Eng., 5, St. Nicholas Parade, Scarborough.
GILES, GEORGE F., M.D., M.R.C.S. Eng., L.S.A., Remenham-hill, Henley-on-Thames.
GODWIN, ASHTON, M.D., L.R.C.P. Lond., M.R.C.S. Eng., L.M., L.S.A., 28, Brompton crescent, Brompton, S.W.
GOODDAY, HORATIO, M.D., M.R.C.S. Eng., L.S.A., M.S.A., 66, Kensington-park-road, W.
GOODMAN, CHARLES R., M.D., M.R.C.S. Eng., L.S.A., 205, York-street, Cheetham, Manchester.
GORDON, C. A., M.D., L.R.C.S. Edin., C.B., Dep. Insp.-Gen. Army Hosps., Dover.
GOSS, S. DAY, M.D., L.R.C.P. Edin., F.R.G.S., 111, Kennington-park-road, S.E.
GOYDER, DAVID, M.D., L.R.C.S. Edin., 62, Great Horton-road, Bradford, Yorkshire.
GRAMSHAW, JAMES H., M.D., M.R.C.S. Eng., L.S.A., Surg. Infirm. and Disp., 25, King-street, Gravesend.
GRAVES, FREDERICK G., M.D., M.R.C.S. Eng., L.S.A., 14, Chichester-road, W.
GRAY, THOMAS S., M.D., M.R.C.S. Eng., L.S.A., Lansdowne House, 340, Essex-road, N.
GREENHALGH, ROBERT, M.D., M.R.C.P. Lond., M.R.C.S. Eng., Phys. Acc. and Lect. on Dis. of Wom. and Children, St. Barthol. Hosp., Cons. Phys. Acc. City of Lond. Lying-in Hosp., Cons. Phys. Samarit. Hosp. for Wom. and Child., 72, Grosvenor-street, W.
GREENWELL, BAKER, M.D., M.R.C.S. Eng., L.S.A., 49, New Finchley-road, N.W.
GREENWOOD, MAJOR, M.D., M.R.C.S. Eng., L.M., L.S.A., 26, Queen's-road, Dalston, N.E.
GRIFFITH, JOHN T., M.D., F.R.C.S. Eng., L.S.A., Talfourd House, Camberwell, S.E.
GRIFFITH, S., M.D., M.R.C.S. Eng., L.S.A., Portmadoc, Carnarvon.
GRIFFITHS, EDWIN T., M.D., L.F.P.S. Glasg., L.M., L.S.A., Grove House, Vauxhall-road, Birmingham.
GRIFFITHS, FRANCIS T., M.D., M.R.C.S. Eng., L.M., L.S.A., B.L. Univ. France, F.S.A., Lect. on Phys. and Path. Anat. Sheffield Med. Sch., 12A, Surrey-street, Sheffield.
GROVE, WILLIAM R., M.D., M.R.C.S. Eng., L.S.A., Med. Off. of Health, St. Ives, Hunts.
GWYNN, S. TAYLEUR, M.D., M.R.C.S. Eng., L.S.A., Whitchurch, Salop.
HALL, EGERTON F., M.D., L.R.C.P. Edin., M.R.C.S. Eng., The Ash Trees, Prescot, Lancashire.
HARDING, CHARLES F., M.D., M.R.C.S. Eng., Whittlesea, Cambridgeshire.
HARLAND, HENRY, M.D., M.R.C.S. Eng., L.S.A., L.M. Glasg., Wadhurst, Sussex.
HARPER, HENRY L., M.D., M.R.C.S. Eng., L.S.A., 28, Norland-square, Notting-hill, W.
HARRIS, CHARLES, M.D., M.R.C.S. Eng., L.S.A., Northiam, Sussex.
HARRIS, HENRY, M.D., F.R.C.S. Eng., L.S.A., Redruth, Cornwall.
HARRISON, A. R., M.D., M.R.C.P. Edin., M.R.C.S. Eng., L.S.A., General Lunatic Asylum, Isle of Man.
HARRISON, CHARLES, M.D., M.R.C.S. Eng., L.S.A., Surg. Lincoln Gen. Disp., Med. Off. of Health, 30, Newland, Lincoln.
HARRISON, J. BOWER, M.D., M.R.C.P. Lond., F.R.C.S. Eng., L.S.A., Higher-Broughton, Manchester.
HARRISON, WILLIAM, M.D., L.R.C.P. Edin., M.R.C.S. Eng., L.M., L.S.A., Gargrave, Leeds.
HASSALL, RICHARD, M.D., Ext. L.R.C.P. Lond., M.R.C.S. Eng., L.S.A., Richmond, Surrey.
HAYDON, N. J., M.D., L.R.C.P. Edin., M.R.C.S. Eng., L.S.A., Bovey Tracey, Devon.
HAYWARD, GEORGE, M.D., M.R.C.S. Eng., L.S.A., 18, Lansdowne-place, Brighton.

HAYWARD, JOHN W., M.D., M.R.C.S. Eng., L.S.A., 117, Grove-street, Liverpool.
HEAD, THOMAS, M.D., F.R.C.P. Edin., M.R.C.S. Eng., L.S.A., Warwick Bridge, Carlisle.
HEARDER, GEORGE J., M.D., L.R.C.S. Edin., Med. Supt. Joint Counties Asylum, Carmarthen.
HECKSHER, MARTIN, M.D., M.D. Berlin, M.R.C.P. Lond., 245, Oxford-road, Manchester.
HELSHAM, H., M.D., F.R.C.S. Eng., L.M., L.S.A., 4, Park-place, Brixton-road, S.W.
HENDERSON, JOHN, M.D., F.R.C.S. Edin., Surg. Leith Hosp., 7, John's-place, Leith.
HENRY, ALEXANDER, M.D., M.R.C.S. Eng., L.S.A., 16, Brunswick-square, W.C.
HENSLEY, HENRY, M.D., M.R.C.S. Eng., L.S.A., Phys. Bath Min. Water Hosp., and Inst. for the Blind, Deaf, and Dumb, 15, Alfred Street, Bath.
HENTY, GEORGE, M.D., M.R.C.S. Eng., 308, Camden-road, N.
HETLEY, FREDERIC, M.D., F.R.C.S. Eng., L.S.A., L.M., Norbury Lodge, Upper Norwood, Surrey.
HIBBERD, EDWARD, M.D., M.R.C.S. Eng., L.M., Westbourne-place, Harrow-road, W.
HIGGINS, CHARLES H., M.D., M.R.C.P. Lond., F.R.C.S. Eng., L.S.A., Alfred House, Birkenhead.
HIGHMORE, NATHANIEL J., M.D., M.R.C.S. Eng., L.S.A., Bradford-on-Avon.
HIGHMORE, WILLIAM, M.D., M.R.C.S. Eng., L.S.A., Sen. Phys. and Surg. Yeatman Hosp., Sherborne, Dorsetshire.
HILL, JOHN D., M.D., F.R.C.S. Eng., L.S.A., Surg. Roy. Free Hosp., Assist. Surg. Roy. Orthopædic Hosp., 17, Guilford-street, W.C.
HILL, SAMUEL, M.D., L.R.C.P. Edin., L.R.C.S.I., L.S.A., L.M., 22, Mecklenburgh-sq., W.C.
HODGSON, ROBERT W., M.D., L.R.C.P. Edin., M.R.C.S. Eng., L.S.A., Northallerton, Yorkshire.
HODGSON, WILLIAM J., M.D., M.R.C.S. Eng., L.S.A., The Butts, Rochdale.
HOLCOMBE, CHARLES A., M.D., M.R.C.S. Eng., L.S.A., 29, South-hill-road, Liverpool.
HOLMAN, C., M.D., M.R.C.S. Eng., L.S.A., Reigate, Surrey.
HOOD, PETER, M.D., L.S.A., 22, Lower Seymour-street, W.
HOOD, WHARTON P., M.D., M.R.C.S. Eng., L.S.A., 65, Upper Berkeley-street, Portman-square, W.
HUGHES, AMBROSE C., M.D., L.R.C.S.I., L.M., L.A.H. Dub., 77, Roscommon-street, Liverpool.
HUGHES, ROBERT, M.D., M.R.C.S. Eng., L.S.A., L.M., Conway, Carnarvon.
HUNT, BENJAMIN, M.D., M.R.C.S. Eng., L.S.A., Surg. Birm. Eye and Ear Hosp., 50, George-street, Edgbaston, Birmingham.
HUNT, WILLIAM JAMES, M.D., F.R.C.P. Edin., L.R.C.P. Lond., M.R.C.S. Eng., L.M., L.S.A., L.F.P.S. Glasg., Phys. and Superint. Hoxton House Lunatic Asylum, Lect. on Mental Diseases Charing Cross Hosp. Med. School, Phys. City Disp., Hoxton House, Hoxton, N.
HUTCHISON, WILLIAM, M.D., L.F.P.S. Glasg., L.M., Loughborough, Leicestershire.
ILES, F. H. WILSON, M.D., M.R.C.S. Eng., L.M., L.S.A., Watford, Herts.
INGHAM, AMOS, M.D., M.R.C.S. Eng., L.S.A., Keighley, Yorkshire.
IRWIN, WILLIAM C., M.D., M.R.C.P. Lond., L.R.C.P. Edin., M.R.C.S. Eng., L.S.A., Belvoir-street, Leicester.
IRWIN, WILLIAM R., M.D., L.R.C.P. Lond., L.R.C.S. Irel., L.M., Monaghan, Ireland.
JACKSON, J. HUGHLINGS, M.D., F.R.C.P. Lond., M.R.C.S. Eng., Phys. Lond. Hosp., Lect. on Physiol. Lond. Hosp. Med. Coll., Phys. Hosp. for Epilepsy and Paralysis, 3, Manchester-square, W.
JEFFERY, GEORGE AUGUSTUS, M.D., M.R.C.S. Eng., L.S.A., Phys. Conv. Hosp. Trinity House, Eastbourne.
JENCKEN, FERDINAND E., M.D., M.R.C.P. Lond., L.M., M.R.C.S. Eng., L.M.K.Q.C.P. Irel., 2, Bay View-terrace, Londonderry.
JEPHCOTT, SAMUEL T., M.D., M.R.C.S. Eng., L.S.A., 182, Foregate-street, Chester.
JEPSON, O., M.D., M.R.C.S. Eng., L.S.A., Med. Superint. City of London Lunat. Asyl., Stone, Dartford, Kent.
JOHNSON, HORACE E., M.D., L.R.C.P. Edin., L.S.A., 8, Ovington-square, Brompton, S.W.
JONES, EDWARD, M.D., B.L. Univ. France, M.R.C.S. Eng., L.S.A., Surg. Sydenham Disp., The Park, Sydenham, Kent.
JONES, THOMAS, M.D., M.R.C.S. Eng., L.S.A., Phys. Ross Disp., 8, Church-street, Ross, Herefordshire.
JONES, WALTER, M.D., M.R.C.S. Eng., L.M., L.S.A., Surg. Western City Disp., 45, Finsbury-square, E.C.
JONES, W. GOODALL, M.D., M.R.C.S. Eng., L.M., L.S.A., 6, Prince Edwin-street, Liverpool.

KEILLER, ALEXANDER, M.D., F.R.C.P. Edin., L.R.C.S. Edin., F.R.S. Edin., Phys. Roy. Matern. Hosp. and Hosp. for Sick Child., Phys. Acc. Roy. Pub. Disp. Edin., Lect. on Midw. and Dis. of Women and Child. Surg. Hall Edin., Exam. in Midw. Univ. St. And., 21, Queen-street, Edinburgh.

KERSEY, ROBERT C., M.D., M.R.C.S. Eng., L.S.A., Littlebourne, Wringham, Kent.

KING, THOMAS K., M.D., M.R.C.S. Eng., L.S.A., L.A.H. Dub., 2, Portland-place, Camberwell, S.E.

KING, THOMAS, M.D., M.R.C.S. Eng., L.S.A., Rochford, Essex.

KINGSFORD, CHARLES D., M.D., M.R.C.S. Eng., L.S.A., Surg. Lond. Orph. Asyl. Clapton, Surg. Roy. Brit. Asyl. for Deaf and Dumb Females, Upper Clapton, N.E.

KITCHING, JOHN, M.D., L.R.C.P. Edin., M.R.C.S. Eng., L.S.A., The Friends' Retreat, York.

LAKE, WILLIAM C., M.D., M.R.C.S. Eng., L.S.A., Surg. Teignmouth, Dawlish, and Newton Infirm., Teignmouth, Devon.

LAWLOR, JEREMIAH, M.D., L.R.C.P. Edin., L.F.P.S. Glasg., L.M., L.A.H. Dub., Phys. Queenstown Fev. and Gen. Hosp., Queenstown, Co. Cork.

LAWRENCE, SAMUEL, M.D., L.R.C.S. Edin., Montrose.

LEE, HERBERT G., M.D., A.A. Oxon., M.R.C.S. Edin., L.S.A., Thame, Oxon.

LEE, MATTHEW, M.D., M.R.C.S. Eng., St. Andrews-villas, Lister-hills, Bradford, Yorkshire.

LEONARD, PETER, M.D., M.R.C.P. Lond., L.R.C.S. Edin., Insp.-Gen. Hosps. and Fleets, Plaisaunce, Upper Norwood, S.

LINDSAY, J. MURRAY, M.D., L.R.C.S. Edin., L.S.A., Med. Superint. County Asylum, Mickleover, Derby.

LIPSCOMB, J. T. N., M.D., F.R.C.S. Eng., L.S.A., Surg. Gen. Disp., St. Albans, Herts.

LLOYD, EDWIN, M.D., M.R.C.S. Eng., L.S.A., 59, Bath-terrace, Worksop, Notts.

LUSH, J. A., M.D., M.R.C.P. Lond., M.R.C.S. Eng., L.S.A., M.P. for Salisbury, Fisherton House, Salisbury.

LYNES, EDWARD, M.D., M.R.C.S. Eng., L.M., L.S.A., Surg. Coventry and Warwicksh. Hosp., 9, Priory-row, Coventry.

LYSTER, CHAWORTH E., M.D., L.R.C.S.I., L.M., L.S.A., Surg. Toxteth-pk. Fev. Hosp., 20, Belvidere-road, Prince's-park, Liverpool.

MACDONALD, JOHN D., M.D., M.R.C.S. Eng., F.R.S., Weston Grove Road, Woolston, Southampton.

MACINTYRE, DUNCAN, M.D., L.R.C.S. Edin., Parade House, Fort William, Inverness-shire.

MACKENZIE, J., M.D., L.R.C.S. Edin., Staff Assist.-Surg. Army, Shorncliffe.

MACKIE, JAMES W. R., M.D., F.R.C.S. Edin., Cupar, Fifeshire.

MACKINDER, DRAPER, M.D., F.R.C.S. Edin., M.R.C.S. Eng., L.S.A., Gainsborough.

MACKINTOSH, ALEXANDER, M.D., L.F.P.S. Glasg., Phys. Supt. Roy. Lunat. Asylum, Gartnavel, Glasgow.

MACKINTOSH, CHARLES H., M.D., L.R.C.P. Lond., M.R.C.S. Eng., L.S.A., Morden Hall, Warren-road, Torquay.

MACLEOD, WILLIAM, M.D., F.R.C.P. Edin., L.R.C.S. Edin., Ben Rhydding, Otley, Yorksh.

MADDEN, LEWIS P., M.D., M.R.C.P. Lond., M.R.C.S. Eng., J.P., Jacobstowe, Exbourne, Devonshire.

MADGE, H. M., M.D., M.R.C.S. Eng., L.S.A., 32, Fitzroy-square, W.

MAGILL, MARTIN, M.D., F.R.C.S. Eng., R.N., H.M.S. "Thetis." (94, Queen's-rd., Bayswater, W.)

MAJOR, HARRY P., M.D., M.R.C.S. Eng., M. and L.S.A., High-street, Hungerford, Berks.

MANFORD, ROBERT A., M.D., F.R.C.S. Edin., L.F.P.S. Glasg., J.P. for Co. Inverness, 8, Ness Bank, Inverness.

MARSDEN, ALEXANDER, M.D., F.R.C.S. Edin., M.R.C.S. Eng., Surg. Roy. Free Hosp., Surg. Cancer Hosp., 65, Lincoln's-inn-fields, W.C.

MARTIN, FREDERICK, M.D., M.R.C.S. Eng., L.S.A., Phillimore House, Beckenham, Kent, S.E.

MARTIN, W. THOMAS, B.A., M.D., Staff-Surg. Army, 9, Herbert-terrace, Dover.

MARTIN, THOMAS, M.D., M.R.C.S. Eng., L.S.A., Pendlebury, Manchester.

MASSEY, ISAAC, M.D., L.R.C.P. Edin., F.R.C.S. Eng., L.S.A., Surg. Nottingham Co. Gaol, Cons. Surg. Nottingham Disp., Wellington-circus, Nottingham.

MATTHEWS, JOHN, M.D., L.S.A., Phys. Lond. Female Peniten. Pentonville, 4, Mylne-street, E.C.

MAUND, HENRY, M.D., M.R.C.S. Eng., L.S.A., Sandown, Isle of Wight.

MAY, HERMAN S., M.D., M.R.C.S. Eng., Summerlands, Exeter.

McCONVILLE, JOHN, M.D., L.R.C.S. Edin., 27, Elmbank-place, Glasgow.

McEWEN, WILLIAM, M.D., M.R.C.P. Lond., L.R.C.S. Edin., Surg. Chester Castle, 20, Nicholas-street, Chester.

McGOWN, JOHN, M.D., L.F.P.S. Glasg., Millport, Isle of Cumbræ, N.B.
McINTYRE, JOHN, M.D., L.R.C.S. Edin., L.S.A., Odiham, Hants.
McLEAN, HUGH, M.D., M.R.C.S. Eng., L.S.A., Corbridge, Northumberland.
MENZIES, WILLIAM, M.D., F.R.C.S. Edin., 3, Lothian-road, Edinburgh.
MERRYWEATHER, HENRY, M.D., M.R.C.S. Eng., Lect. on Dent. Surg. Sheffield Sch. of Med., 17, Howard-street, Sheffield.
MILES, EDWIN J., M.D., M.R.C.S. Eng., L.S.A., Gillingham, Dorsetshire.
MILLER, CLAUDIUS M., M.D., L.R.C.P. Edin., M.R.C.S. Eng., L.S.A., Claremont Villa, Stoke Newington-road, N.E.
MILLS, W. PARTRIDGE, M.D., L.R.C.P. Lond., M.R.C.S. Eng., L.S.A., Ipswich.
MINTER, JOHN M., M.D., F.R.C.S. Eng., L.S.A., Dep. Insp.-Gen. Hosps. and Fleets, 11, Norland Square, Notting Hill, W.
MOON, HENRY, M.D., F.R.C.P. Lond., M.R.C.S. Eng., L.S.A., Phys. Sussex Co. Hosp., 9, Old Steyne, Brighton.
MOORE, DANIEL, M.D., M.R.C.S. Eng., L.S.A., 3, Wellington-square, Hastings.
MOORE, GEORGE, M.D., M.R.C.P. Lond., M.R.C.S. Eng., L.S.A., Hastings.
MOORE, GEORGE, M.D., M.R.C.S. Eng., L.S.A., Phys. Hartlepool Hosp., Hartlepool, Durham.
MORGAN, SAMUEL, M.D., M.R.C.S. Eng., L.S.A., 46, Rivers-street, Bath.
MORGAN, WILLIAM W., M.D., M.R.C.S. Eng., L.S.A., Newport, Monmouthshire.
MORRIS, EDWIN, M.D., F.R.C.S. Eng., L.S.A., High-street, Spalding, Lincolnshire.
MOTT, CHARLES, M.D., M.R.C.S. Eng., L.S.A., Walton-on-Thames.
MOTT, CHARLES GEORGE, M.D., M.R.C.S. Eng., L.S.A., 3, Chester-terr., Regent's-pk., N.W.
MURRAY, JOHN C., M.D., L.R.C.S. Edin., L.M., L.R.C.P. Edin., 44, Newgate-street, Newcastle-on-Tyne.
NASH, J. P., M.D., M.R.C.S. Eng., Surg. 63rd Regt., 9, Regent's-park-terrace, N.W.
NEAL, JAMES, M.D., M.R.C.S. Eng., L.S.A., Surg. Birmingham Lying-in Hosp., Sandown, Isle of Wight.
NEEDHAM, FREDERICK, M.D., M.R.C.P. Edin., M.R.C.S. Eng., L.M., L.S.A., Res. Med. Superint. York Lunat. Asyl., Bootham, York.
NESFIELD, STEPHEN, M.D., M.R.C.S. Eng., L.S.A., Surg. St. Mary's Hosp., Richmond-place, Old Trafford, Manchester.
NICHOLAS, GEORGE E., M.D., M.R.C.S. Eng., L.M., L.S.A., Med. Off. of Health for Wandsworth, 3, Church-row, Wandsworth, S.W.
NICHOLLS, JAMES, M.D., L.R.C.P. Lond., M.R.C.P. Edin., F.R.C.S. Eng., L.M., L.S.A., Chelmsford.
NICHOLLS, JOHN F., M.D., M.R.C.P. Lond., M.R.C.S. Eng., Surg. Roy. Wilts Militia, Devizes.
NORRIS, RICHARD, M.D., M.R.C.S. Eng., Prof. Physiol. Queen's Coll. Birm., Birchfields, Birmingham.
NORRIS, WILLIAM, M.D., L.S.A., Stourbridge, Worcestershire.
O'CONNOR, WILLIAM, M.D., M.R.C.S. Eng., L.S.A., Sen. Phys. Royal Free Hosp., 30, Upper Montagu-street, Montagu-square, W.
O'NEILL, EDWARD J., M.D., L.R.C.S.I., L.A.H. Dub., 27, North Earl-street, Dublin.
OSBORNE, HENRY, M.D., M.R.C.S. Eng., L.S.A., Phys. Islington Disp., 3, Gibson-square, Islington, N.
OSBORNE, JOHN, M.D., F.R.C.S. Eng., L.S.A., Bitterne, Southampton.
OWEN, HARVEY K., M.D., F.R.C.S. Eng., M. and L.S.A., Surg. South Lambeth Disp., 260, Clapham-road, S.
PAGE, ALEXANDER H., M.D., L.K.Q.C.P. Irel., M.R.C.S. Eng., Mount Heber, Clevedon, Somerset.
PAINE, HENRY J., M.D., M.R.C.S. Eng., L.S.A., F.A.S.L., Phys. Glamorgansh. Infirm., Med. Off. of Health for Cardiff, 11, Crockherbtown, Cardiff.
PAINTER, R. BUDD, M.D., F.R.C.S. Eng., M. and L.S.A., 4, Beaufort-gardens, Brompton-road, S.W.
PARKER, WILLIAM, M.D., L.F.P.S. Glasg., L.S.A., Med. Off. of Health for Bermondsey, 133, Grange-road, Bermondsey, S.E.
PARRATT, JAMES, M.D., M.R.C.S. Eng., M. and L.S.A., Mem. Court of Exam. Apoth. Soc., Blenheim Villa, Northumberland-park, Tottenham, N.
PAUL, JOHN H., M.D., M.R.C.P. Lond., F.R.C.P. Edin., F.R.C.S. Eng., L.S.A., Med. Superint., Camberwell House Asylum, S.E.
PERRY, MARTIN, M.D., L.R.C.P. Edin., M.R.C.S. Eng., L.M., L.S.A., Church-street, Spalding.
PHIPPS, GEORGE C., M.D., L.R.C.P. Edin., L.R.C.S. Edin., L.M., 246, Clairville, Oxford-road, Manchester.

PIKE, THELWELL, M.D., M.R.C.S. Eng., L.S.A., Weyhill, Andover, Hants.
POCOCK, WILLIAM, M.D., M.R.C.S. Eng., L.S.A., 337, Brixton-road, S.
POLLOCK, A. JULIUS, M.D., M.R.C.P. Lond., M.R.C.S. Eng., Assist. Phys. Charing Cross Hosp., Phys. Foundling Hosp., 86, Harley-street, W.
POWELL, JOSIAH T., M.D., L.R.C.P. Lond., L.R.C.P. Edin., M.R.C.S. Eng., L.S.A., 347, City-road, E.C.
PRESTON, WILLIAM J., M.D., M.R.C.S. Eng., L.S.A., 42, Belsize-road, St. John's-wood, N.W
PROCTER, WILLIAM, M.D., M.R.C.S. Eng., L.S.A., F.C.S., Surg. York Disp., 24, Petergate, York
PYBURN, JAMES, M.D., L.R.C.P. Lond., M.R.C.S. Eng., L.S.A., 34, Prospect-street, Hull.
RAMSBOTHAM, JOSEPH M., M.D., M.R.C.S. Eng., L.S.A., 15, Amwell-street, E.C.
RANSOM, ROBERT, M.D., F.R.C.S. Eng., L.M., L.S.A., 5, Jesus-lane, Cambridge.
REED, G., M.D., M.R.C.S. Eng., L.S.A., Res. Med. Off. Roy. Infirm., Manchester.
REEVES, WILLIAM, M.D., M.R.C.S. Eng., L.S.A., 5, The Crescent, Carlisle.
RENSHAW, HERBERT S., M.D., L.R.C.P. Lond., L.F.P.S. Glasg., L.M., L.S.A., Sale Bridge House, Sale, Cheshire.
RICHARDSON, BENJAMIN W., M.A., M.D., F.R.C.P. Lond., F.R.S., Assessor of Gen. Council in Univ. Court., 12, Hinde-street, W.
RICHARDSON, WILLIAM, M.D., A.M. Aberd., M.R.C.P. Lond., Oatlands, Mortimer Road, Kilburn, N.W.
RICKETTS, CHARLES, M.D., M.R.C.S. Eng., L.S.A., F.G.S., 1, Price-street, Birkenhead.
ROBERTS, ANTHONY T., M.D., M.R.C.S. Eng., 11, Lamb's Conduit-street, W.C.
ROBERTS, DAVID LLOYD, M.D., M.R.C.P. Lond., M.R.C.S. Eng., L.S.A., Phys. St. Mary's Hosp. Manchester, 23, St. John-street, Manchester.
ROBERTS, JOHN, M.D., M.R.C.S. Eng., L.S.A., L.M. Dub., Talarvor, Criccieth, Carnarvon.
ROBERTSON, C. A. LOCKHART, M.D., M.D. Gonville and Caius Coll. Cantab., M.B. Oxon., F.R.C.P. Lond., F.R.C.P. Edin., L.R.C.S. Edin., Chancery Visitor of Lunatics, 9, Hanover-square, W.
ROBINSON, THOMAS, M.D., M.R.C.S. Eng., L.S.A., 35, Lamb's Conduit-street, W.C.
RODEN, WILLIAM, M.D., A.M., L.R.C.P. Edin., F.R.C.S. Eng., L.S.A., J.P., The Grange, Kidderminster.
ROE, JOHN W., M.D., M.R.C.S. Eng., L.M., L.S.A., Coroner for Ellesmere, Dep. Coroner Pimhill Dist. N. Div. Co. Salop, Ellesmere, Salop.
ROGERS, GEORGE, M.D., L.R.C.P. Lond., M.R.C.S. Eng., L.S.A., Longwood House, Long Ashton, Bristol.
ROGERS, JOSEPH, M.D., M.R.C.S. Eng., L.S.A., 33, Dean-street, W.
ROGERS, THOMAS L., M.D., M.R.C.P. Lond., M.R.C.S. Eng., L.M., Med. Supt. Co. Asyl., Rainhill, Lancashire.
ROODS, H. CROWHURST, M.D., M.R.C.S. Eng., Westham, Eastbourne, Sussex.
ROSE, H. COOPER, M.D., M.R.C.S. Eng., L.S.A., F.L.S., F.G.S., Surg. Hampstead Disp., High-street, Hampstead, N.W.
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ROSS, GEORGE, M.D., L.R.C.P. Edin., M.R.C.S. Eng., L.S.A., 11, Hart-st., Bloomsbury, W.C.
ROSS, JAMES J., M.D., L.R.C.S. Edin., Med. Att. Northern Infirm., Cons. Phys. Inverness Dist. Asyl., 65, Church-street, Inverness.
ROYLE, OCTAVIAN N., M.D., F.R.C.S. Eng., Milnthorpe, Westmoreland.
ROYLE, PETER, M.D., L.R.C.P. Edin., M.R.C.S. Eng., L.S.A., J.P., Vernon Lodge, Sale, Manchester.
ROYSTON, CHARLES, M.D., L.R.C.P. Edin., M.R.C.S. Eng., L.M., L.S.A. 1, St. Stephen's-crescent, Westbourne-park, W.
SANDERSON, HUGH J., M.D., M.R.C.P. Lond., M.R.C.S. Eng., L.S.A., Phys. Hosp. for Wom., Soho-square, 26, Upper Berkeley-street, W.
SANDWITH, HUMPHRY, M.D., F.R.C.P. Lond., Cons. Phys. Hull Gen. Infirm., Todwick Rectory, Sheffield.
SANKEY, WILLIAM, M.D., M.R.C.S. Eng., L.S.A., Sutton-Valence, Staplehurst, Kent.
SARJANT, JOSIAH, M.D., L.R.C.P. Edin., M.R.C.S. Eng., L.M., West Ferry-road, Isle of Dogs, E.
SAVAGE, THOMAS, M.D., L.R.C.P. Lond., F.R.C.S. Eng., L.S.A., Prof. of Comp. Anat. Queen's Coll. Birmingham, Bordesley, Birmingham.
SAVORY, CHARLES T., M.D., M.R.C.S. Eng., L.S.A., 1, Douglas-road, Canonbury, N.
SCHOFIELD, FRANK, M.D., M.R.C.S. Eng., L.S.A., Asst. Phys. Camberwell House Lunatic Asylum, S.
SCOTT, WILLIAM, M.D., F.R.C.P. Edin., F.R.C.S. Eng., L.K.Q.C.P. Irel., L.M., Phys. Auchnacloy Fev. Hosp. and Disp., Auchnacloy, Co. Tyrone.
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SEALY, GEORGE J., M.D., M.R.C.S. Eng., L.S.A., Oatlands-park, Weybridge, Surrey.
SEATON, JOSEPH, M.D., F.R.C.P. Edin., Halliford House, Sunbury, Middlesex.
SEDGWICK, LEONARD W., M.D., M.R.C.S. Eng., L.S.A., 2, Gloucester-terr., Hyde-pk., W.
SELWOOD, HENRY C., M.D., M.R.C.S. Eng., L.S.A., Hursley, Winchester.
SEMPLE, A., M.D., L.R.C.S. Edin., Staff Surg., Bombay.
SEMPLE, R. H., M.D., M.R.C.P. Lond., M.R.C.S. Eng., L.S.A., Phys. Eastern Disp., 8, Torrington-square, W.C.
SHARPLEY, THOMAS, M.D., M.R.C.S. Eng., L.S.A., County Coroner, Eastgate, Louth, Lincolnshire.
SHEPPARD, EDGAR, M.D., M.R.C.P. Lond., F.R.C.S. Eng., L.S.A., Med. Superint. Male Depart. Co. Asyl., Colney Hatch, Middlesex.
SHETTLE, RICHARD C., M.D., London-street, Reading.
SHORTHOUSE, J. H., M.D., M.R.C.S. Eng., L.S.A., LL.D., The Grove, Carshalton, Surrey.
SKRIMSHIRE, GEORGE, M.D., L.S.A., 68, Talbot-road, Westbourne-park, W.
SMITH, ALEXANDER M., M.D., M.R.C.S. Edin., Ibroxholm, Govan, Glasgow.
SMITH, JOSEPH, M.D., M.R.C.S. Eng., L.S.A., Phys. Warrington Disp., Friar's-green House, Warrington.
SMITH, J. SYDNEY, M.D., M.R.C.S. Eng., L.M., L.S.A., Surg. Tiverton Disp., Peter-street, Tiverton, Devon.
SMITH, SAMUEL W., M.D., M.R.C.S. Eng., L.M., L.S.A., Pershore, Worcestershire.
SOULBY, HENRY, M.D., L.R.C.P. Edin., M.R.C.S. Eng., L.S.A., Waverley House, Hull.
STAMPER, JAMES F., M.D., M.R.C.S. Eng., L.M., L.S.A., Bush-street, Pembroke Dock.
STAPLES, J. H. PROSSER, M.D., M.R.C.S. Eng., 9, Burwood-place, Edgware-road, W.
STEDMAN, JAMES R., M.D., F.R.C.S. Eng., L.S.A., Surg. Roy. Surrey Co. Hosp., Coroner for Borough, Guildford.
STILES, HENRY T., M.D., M.R.C.S. Eng., L.M., L.S.A., Spalding, Lincolnshire.
STILWELL, ROBERT R., M.D., M.R.C.S. Eng., L.S.A., Beckenham, Kent.
STOCKER, ALONZO H., M.D., M.R.C.P. Lond., M.R.C.S. Eng., L.S.A., Peckham House, Peckham, S.E.
STOKOE, RICHARD, M.D., F.R.C.S. Eng., L.S.A., Cons. Phys. Peckham and Peckham-rye Disp., Upper Bordean House, Petersfield, Hants.
STOVIN, CORNELIUS F., M.D., L.R.C.P. Edin., L.R.C.S., Wheatley, Oxon.
STUTTER, FREDERICK A., M.D., M.R.C.S. Eng., L.M., L.S.A., Farnborough House, Upper Sydenham, Kent.
SUCKLING, CORNELIUS B., M.D., M.R.C.S. Eng., L.S.A., Sen. Obstet. Surg. Queen's Hosp., St. Mary's-square, Birmingham.
SULLIVAN, EDWARD W., M.D., M.R.C.S. Eng., L.S.A., L.M., Great Ilford, Essex.
SUTTON, WILLIAM, M.D., M.R.C.S. Eng., L.M., L.S.A., Camden-crescent, Dover.
SWETE, HORATIO WALKER, M.D., 31, Lansdowne-place, Leamington.
TANNER, JOHN, M.D., M.R.C.P. Lond., M.R.C.S. Eng., F.L.S., Phys. Farringdon Disp., Obstet. Phys. Lying Inn Charity Holborn, Alfred House, 118, Newington-causeway, S.E.
TAYLER, WILLIAM H., M.D., M.R.C.S. Eng., L.M., L.S.A., Tudor House, Anerley, S.E.
TAYLOR, CHARLES, M.D., M.R.C.S. Eng., L.S.A. Edin., Pine House, Camberwell-park, S.E.
TAYLOR, GEORGE, M.D., F.R.C.S. Eng., L.S.A., Phys. Derbysh. Gen. Infirm., 9, Friargate, Derby.
TENISON, EDW. T. R., M.D., L.R.C.P. Lond., M.R.C.S. Eng., L.M. Angl. Hosp. Dub., 9, Keith-terrace, Shepherd's Bush, W.
THOMSON, SPENCER, M.D., L.R.C.S. Edin., L.S.A., Ashton House, Torquay.
TIBBITS, JOHN, M.D., M.R.C.S. Eng., L.M., L.S.A., Jury-street, Warwick.
TODD, JOHN M., M.D., M.R.C.S. Eng., L.S.A., Bognor, Sussex.
TREWHELLA, HENRY E., M.D., M.R.C.S. Eng., L.M., Headingley, Leeds.
TUKE, THOMAS HARRINGTON, M.D., F.R.C.P. Edin., M.R.C.P. Lond., M.R.C.S. Eng., 37, Albemarle-street, W.
TURNER, GEORGE B., M.D., M.R.C.S. Eng., L.S.A., Surg. East Sussex, Hastings, and St. Leonard's Infirm., 3, Warrior-square, St. Leonard's-on-Sea.
TURNOUR, HENRY E., M.D., M.R.C.S. Eng., L.S.A., Surg. Market Rasen Disp., Market Rasen, Lincolnshire.
TURTLE, FREDERICK, M.D., M.R.C.S. Eng., L.S.A., Clifton Lodge, Woodford, Essex.
TYLECOTE, JOHN H., M.D., L.R.C.S. Edin., L.M., L.S.A., Sandon, Stone, Staffordshire.
TYLEY, RICHARD P., M.D., M.R.C.S. Eng., L.S.A., Wedmore, Somerset.
TYTE, EDWARD C., M.D., M.R.C.S. Eng., L.S.A., Harrow-on-the-Hill, Middlesex.
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VINCENT, JAMES, M.D., M.R.C.S. Eng., L.S.A., East Dereham, Norfolk.
WALKER, GEORGE C., M.D., M.R.C.S. Eng., L.S.A., Bootle, Liverpool.

WALKER, JOSEPH, M.D., M.R.C.S. Eng., L.D.S., Dent. Surg. and Lect. Westminster Hosp., 22, Grosvenor-street, W.
WALKER, JOHN S., M.D., M.R.C.S. Eng., L.M., L.S.A., Med. Off. Health for Hanley, Hallfields Cottage, Hanley, Staffordshire.
WARD, JOHN, M.D., M.R.C.S. Eng., Grange, Carnforth, Lancashire.
WARING, EDWARD J., M.D., F.R.C.P. Lond., F.R.C.S. Eng., F.L.S., 39, Portsdown-gardens, Maida-hill, W.
WATCHORN, ISAAC, M.D., Raleigh House, Raleigh-street, Nottingham.
WATKINS, EDWIN T., M.D., M.R.C.S. Eng., L.S.A., Surg. St. Pancras Prov. Disp., 61, Guilford-street, W.C.
WATSON, JOHN, M.D., L.R.C.P. Edin., M.R.C.S. Eng., L.M., L.S.A., 6, Southampton-street, Bloomsbury, W.C.
WEBB, WILLIAM, M.D., F.R.C.S. Eng., L.M., F.R.C.S. Edin., L.S.A., Gilkin View House, Wirksworth, Derbyshire.
WEIR, ARCHIBALD, M.D., F.R.C.S. Edin., St. Mungho's, Great Malvern.
WELSH, JAMES, M.D., L.R.C.S. Edin., J.P., Kinghorn, Fifeshire, N.B.
WHITEHEAD, JOHN, M.D., M.R.C.S. Eng., L.S.A., Ventnor, Isle of Wight.
WHITMARSH, WILLIAM M., M.D., M.R.C.S. Eng., L.M., L.S.A., Dep. Coroner for Wilts, Hounslow, Middlesex.
WHITMORE, JOHN, M.D., M.R.C.S. Eng., L.S.A., Med. Off. Health for St. Marylebone, 15, Wimpole-street, W.
WILKINSON, FREDERIC E., M.D., L.R.C.P. Edin., M.R.C.S. Eng., L.S.A., F.R.G.S., Med. Off. Health for Lewisham Dist., Battle Cottage, Sydenham, Kent.
WILKINSON, THOMAS, M.D., F.R.C.S. Irel., 28, Trinity-square, Brixton.
WILLETT, E. SPARSHALL, M.D., M.R.C.P. Lond., M.R.C.S. Eng., Wyke House, Syon-hill, Isleworth.
WILLETT, MATTHEW, M.D., M.R.C.S. Eng., Surg. Acc. Bristol Disp., Easton, Bristol.
WILLIAM, JOHN, M.D., M.R.C.S. Eng., L.S.A., Penygroes, Llanllyfni, Carnarvonshire.
WILLIAMS, A. WYNN, M.D., M.R.C.S. Eng., L.S.A., Phys. Samaritan Hosp., Phys. Acc. Western Gen. Disp., 1, Montagu-square, W.
WILLIAMS, C. RICE, M.D., L.R.C.P. Edin., M.R.C.S. Eng., L.S.A., Aberystwith, Cardigan.
WILLIAMS, DAVID W., M.D., M.R.C.P. Lond., M.R.C.S. Eng., late Phys. West Norf. and Lynn Hosp., Bury St. Edmunds.
WILLIAMS, EDWARD, M.D., M.R.C.S. Eng., L.S.A., Holt-street House, Wrexham.
WILLIAMS, JOHN, M.D., M.R.C.S. Eng., L.S.A., Trosnant Lodge, Pontypool, Monmouth.
WILLIAMS, JOHN, M.D., M.R.C.S. Eng., L.S.A., Swinton, Manchester.
WILLIAMS, S. W. DUCKWORTH, M.D., L.R.C.P. Lond., M.R.C.S. Eng., L.S.A., Med. Superint. Co. Asyl., Hayward's-heath, Sussex.
WILLIAMS, WILLIAM J., M.D., F.F.P.S. Glasg., M.R.C.S. Eng., L.S.A., 231, Oldham-road, Manchester.
WILLIAMS, W. RHYS, M.D., L.K.Q.C.P. Irel., M.R.C.P. Edin., M.R.C.S. Eng., Bethlehem Hospital, S.E.
WILLIAMSON, JAMES, M.D., L.R.C.S. Edin., L.M., L.S.A., 44, Mildmay-park, N.
WILTSHIRE, ALFRED, M.D., M.R.C.P. Lond., Med. Insp. H.M. Privy Council, Sen. Phys. Islington Disp., 57, Wimpole-street, W.
WISE, WILLIAM C., M.D., L.R.C.P. Lond., M.R.C.S. Eng., L.S.A., Plumstead, Kent.
WITHECOMBE, JOHN R., M.D., M.R.C.P. Lond., F.R.C.S. Eng., L.S.A., Croydon, Surrey.
WOOD, HENRY B., M.D., M.R.C.S. Eng., L.S.A., Cranbrook, Kent.
WOODMAN, FREDERICK, M.D., L.R.C.P. Lond., M.R.C.S. Eng., Surg. Deal and Walmer Disp., Queen-street, Deal, Kent.
WOODMAN, W. BATHURST, M.D., M.R.C.P. Lond., M.R.C.S. Eng., L.M., M. & L.S.A., 6, Christopher-street, Finsbury, E.C.
WOODWARD, WILLIAM, M.D., L.R.C.P. Lond., M.R.C.S. Eng., L.M., L.S.A., 22, Foregate-street, Worcester.
WRANGHAM, JOHN D., M.D., M.R.C.S. Eng., L.S.A., Wragby, Lincolnshire.
WYMAN, W. S., M.D., M.R.C.S. Eng., L.S.A., Westlands, Upper Richmond-road, Putney.
WYNTER, ANDREW, M.D., M.R.C.P. Lond., 1, Bolton-road, Chiswick.
WYSE, GEORGE, M.D., L.A.H. Dub., L.M., Gov. of Apoth. Hall, Dub., 8, Cavendish-row, Rutland-square, Dublin.
YELD, HENRY J., M.D., M.R.C.S. Eng., L.S.A., L.M. Glasg., Assist. Surg. 3rd Durham R. V., Surg. Eye Infirmary, Surg. Gen. Infirmary, 19, Bridge-street, Sunderland.
YELF, LEONARD K., M.D., M.R.C.S. Eng., L.S.A., Moreton-in-Marsh, Gloucestershire.
YOUNG, GEORGE E., M.D., M.R.C.S. Eng., Hyde Park, Leeds.
YOUNG, HENRY J., M.D., M.R.C.S. Eng., L.M., L.S.A., Erdington, Birmingham.

ASSOCIATES.

BATELEY, JOHN, L.R.C.P. Lond., M.R.C.S. Eng., Southtown, Great Yarmouth.

BIRD, P. HINCKES, F.R.C.S. Eng., L.M., L.S.A., F.L.S., 1, Norfolk-square, W.

BROOM, JOHN, L.K.Q.C.P. Irel., L.R.C.S. Ed., L.M., Sheffield.

COLES, G. C., M.R.C.S. Eng., Surg. London Infirm. for Epilepsy and Paralysis, 20, Great Coram-street, W.C.

DUNN, ROBERT W., M.R.C.S. Eng., M.S.A., Surg. Farringdon Disp., 13, Surrey-street, Strand, W.C.

FOX, TILBURY, M.D. Lond., M.R.C.P. Lond., Phys. Skin Dep. Univ. Coll. Hosp., 14, Harley-street, W.

HEARNDEN, WILLIAM A., M.D. & Ch.D. Brussels, L.R.C.P. Edin., L.F.P.S. Glasg., L.M., Sutton, Surrey.

HILL, R. GARDINER, L.R.C.P. Edin., M.R.C.S. Eng., L.S.A., Earl's Court House, Old Brompton, S.W.

HILL, T. H., M.R.C.S. Eng., L.S.A., 4, Stanhope-terrace, Bayswater-road, W.

KERNOT, GEORGE C., M.D. Alb., M.D. & D.Ph. Giess., L.D.S., L.S.A., Chrisp-street, Poplar, E.

KERSHAW, JOSEPH, M.R.C.S. Eng., 23, Byrom-street, Manchester.

KIERNAN, LAWRENCE, M.R.C.S. Eng., L.S.A., L.M., 46, Hall-gate, Doncaster.

LEWIS, HENRY, M.D. Bruss., M.R.C.S. Eng., L.S.A., Folkestone, Kent.

LOWNE, B., F.R.C.S. Eng., L.S.A., Hon. Surg. Farringdon Disp., 49, Colville-gardens, W.

MARSHALL, PETER, M.R.C.S. Eng., L.S.A., late Pres. Med. Soc. Lond., 43, Bedford-square, W.

MILLAR, JOHN, L.R.C.P. Edin., L.R.C.S. Edin., F.G.S., F.L.S., Med. Superint. Bethnal House Asyl., Cambridge-road, N.E.

PETTINGER, G. W., M.R.C.S. Eng., L.S.A., Sen. Surg. St. Mary's Hosp., 3, Trafford-street, Stretford New-road, Manchester.

ROW, WILLIAM, M.R.C.S. Eng., L.S.A., Market Overton, Oakham, Rutland.

RUGG, GEORGE PHILIP, M.D. Aberd., L.R.C.P. Lond., M.R.C.S. Eng., L.M., L.S.A. Stockwell-villa, Clapham-road, S.W.

SEDGWICK, JAMES, M.R.C.S. Eng., L.M., L.S.A., Boroughbridge, Yorkshire.

WHITEHEAD, WALTER, F.R.C.S. Edin., L.F.P.S. Glasg., L.M., L.S.A., Surg. St. Mary's Hosp., 234, Oxford-road, Manchester.

WHITEMAN, R. H., L.R.C.P. Edin., L.S.A., Med. Off. Health, Hotham House, Putney, Surrey.

HONORARY MEMBERS.

ADAMS, ROBERT, A.M., C.M., M.D. Dub., F.R.C.S. Irel., Regius Prof. of Surg. Trin. Coll. Dub., 22, St. Stephen's-green-north, Dublin.

ARGYLL, HIS GRACE THE DUKE OF, K.T., LL.D., F.R.S., Chancellor of the University of St. Andrews, Inverary Castle, Argyllshire.

ARMSTRONG, SIR W., K.C.B., Director-General Navy Medical Department.

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BAYNES, T. S., LL.B., Prof. of Logic and Metaphys. Univ. of St. Andrews.

BELCHER, VICE-ADMIRAL SIR EDWARD, K.C.B., 22a, Connaught-square, London, W.

BELL, OSWALD H., M.D., F.R.C.S. Edin., Prof. of Med. Univ. of St. Andrews.

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BILLING, ARCHIBALD, M.A., M.D. Oxon, F.R.C.P. Lond., F.R.S., F.G.S., 6, Grosvenor-gate, W.

BROWN, REV. WILLIAM, D.D., Prof. of Divin. Univ. of St. Andrews, Manse of Gairloch, Dingwall, Ross-shire.

BROWN-SEQUARD, E., M.D., F.R.S., F.R.C.P. Lond., Prof. Exp. Pathol. Univ. Paris, 28, Rue Gay Lussac, Paris.

COOPER, GEORGE, F.R.C.S. Eng., Mem. Gen. Coun. Med. Educat. and Registr., Brentford, Middlesex.

CORRIGAN, SIR DOMINIC, Bart., M.D. Dub., M.D. Edin., Hon. F.K.Q.C.P. Irel., M.R.C.S. Eng., M.P., Phys. in Ord. to H.M. the Queen in Irel., 4, Merrion-square-west, Dublin.

DIXON, W. HEPWORTH, 6, St. James'-terrace, Regent's-park, N.W.

ECKHARD, C., M.D., Prof. of Physiol. Univ. of Giessen.

FARR, WILLIAM, M.D., F.R.S., D.C.L., Gen. Register Office, Somerset House, W.C.

FERGUSSON, SIR WILLIAM, Bart., F.R.C.S. Eng., F.R.C.S. Edin., F.R.S., Surg. and Prof. of Surg. King's Coll. Hosp., Serj.-Surgeon to H.M. the Queen, 16, George-street, Hanover-square, W.

FROUDE, J. A., M.A., late Rector of the University of St. Andrews, 7, Onslow-gardens, S.W.

GLAISHER, JAMES, F.R.S., Blackheath, Kent.

HALFORD, GEORGE B., M.D., M.R.C.P. Lond., M.R.C.S. Eng., L.S.A., Prof. Anat. Univ. of Melbourne, Australia.

HAMMOND, DR., 162, West 34th-street, New York.

HUXLEY, PROF., F.R.S., Royal School of Mines, Jermyn-street, S.W.

JENNER, SIR W., Bart., K.C.B., M.D. Lond., F.R.S., F.R.C.P. Lond., Phys. in Ord. to H.M. the Queen and to H.R.H. the Prince of Wales, Phys. Univ. Coll. Hosp., Prof. Clin. Med. Univ. Coll., 63, Brook-street, Grosvenor-square, W.

KÖHLER, H., M.D., Prof. of Med. Univ. of Halle.

LOGAN, SIR T. G., K.C.B., Director-General Army Medical Department.

MACDONALD, WILLIAM, M.D., F.R.C.P. Edin., F.R.S.E., F.L.S., F.G.S., Prof. of Civ. and Nat. Hist. Univ. of St. Andrews.

MACLAURIN, H. NORMAND, M.A., M.D., H.M.S. "Impregnable," Devonport, Devon.

MENZIES, JAMES, M.A., 24, Carlton-hill, St. John's Wood, N.W.

MITCHELL, S. WEIR, M.D., 1332, Wallnut-street, Philadelphia.

OWEN, R., F.R.S., F.R.C.S. Eng., Sheen Lodge, Richmond-park

PAGET, SIR JAMES, Bart., F.R.C.S. Eng., D.C.L. Oxon., F.R.S., Surg. Extr. to H.M. the Queen, Surg. to H.R.H. the Prince of Wales, Surg. St. Barthol. Hosp., 1, Harewood-place, Hanover-square, W.

PLAYFAIR, THE RIGHT HON. LYON, LL.D., F.R.S., C.B., M.P., 4, Queensberry-place, South Kensington, S.W.

POLLI, GIOVANNI, M.D., Milan.

POLLOCK, SIR F., Bart. 59, Montagu-square, W.

ROBINSON, MR. SERJEANT B. COULSON, 43, Mecklenburgh-square, W.C.

RUSKIN, J., Denmark-hill, S.E.

SARAZIN, JULES, 37, Rue de Bellechasse, Paris.

SCLATER-BOOTH, GEORGE, M.P., Priory, Odiham, Hants.

STIRLING, SIR WILLIAM MAXWELL, Bart., M.P., LL.D., Keir House, Dumblane, Perthshire.

STRACHAN, ALEXANDER RUSSELL, M.D., late Med. Superint. St. Luke's Hosp. New York, 47, East 23rd-street, New York.

STRATHEDEN & CAMPBELL, THE RIGHT HON. LORD, Hartrigge House, Roxburghshire.

THOMPSON, ALLEN, M.D. Edin., F.R.C.S. Edin., F.R.S. Lond. and Edin., Represent. of Univ. of Glasg. and St. And. in Gen. Med. Council, Glasgow College.

TULLOCH, THE VERY REV. JOHN, D.D., Principal of St. Mary's College, Vice Chancellor of the University of St. Andrews.

WATSON, SIR THOMAS, Bart., M.D., LL.D. Cantab., D.C.L. Oxon, F.R.C.P. Lond., F.K.Q.C.P. Irel., F.R.S., 16, Henrietta-street, Cavendish-square, W.

LAWS

OF THE

ST. ANDREWS MEDICAL GRADUATES' ASSOCIATION.

TITLE.

1.—The Association shall be called "The St. Andrews Medical Graduates' Association."

OBJECTS.

2.—The objects of the Association shall be the advancement of the Science and Art of Medicine, and of General Science and Literature, the maintenance of the interests of the Medical Graduates of the University, and the cultivation of social intercourse and good fellowship.

CONSTITUTION.

3.—The Association shall consist of Members, Honorary Members, and Associates.

4.—All Medical Graduates of the University of St. Andrews shall be eligible as Members, if recommended by two Members of the Association.

5.—All Members of the General Council, all Professors, and all non-medical Graduates of the University of St. Andrews, shall be eligible as Honorary Members, as well as such other learned and scientific men as may be recommended by the Council.

6.—All legally qualified Medical Practitioners shall be eligible for admission as Associates.

7.—Members, Honorary Members, and Associates, shall be admitted only at the General Sessions of the Association. The election shall be by ballot, and no one shall be declared elected unless two-thirds of the Members present vote in his favour.

8.—A Member, Honorary Member, or Associate, may withdraw from the Association by paying such subscriptions as may be due from him, and signifying his intention in writing to the President.

9.—No Member, Honorary Member, or Associate, shall be removed from the Association, for other cause than non-payment of Subscription, except in

accordance with the following regulations. A written notice of the proposed removal, signed by two Members of the Association, shall be sent to the Honorary Secretary, who shall immediately forward a copy of the charge to the Member accused, and shall at the same time summon the Council to meet within twenty-one days. He shall send a notice of the subject to be discussed to each Member of the Council at least fourteen days before the date of such meeting. If the Council shall resolve, by a majority of those present, that the Member so accused ought to be expelled, a notice shall be forthwith sent to each Member of the Association, making the next General Session special for the consideration of such removal, and if two-thirds of the Members voting shall be of opinion that the Member in question shall be expelled, the President shall direct the Honorary Secretary to remove his name from the list of Members. The votes shall be taken by ballot.

10.—The subscription constituting a Member or Associate shall be Five Shillings annually, due on the first of January in each year.

EXECUTIVE.

11.—The Officers of the Association shall be elected from the Members, and shall consist of a President, Six Vice-Presidents, a President of Council, a Treasurer, a Secretary, and a Council of Thirty-two; in whom the power of framing bye-laws, and of directing the affairs of the Association, shall be vested.

12.—Presidents of the Association shall, on retiring from office, become Honorary Members of Council.

13.—Five Members of the Council shall form a quorum.

14.—The Officers of the Association shall be elected by ballot at each Anniversary Session of the Association.

15.—The Officers of the Association shall be eligible for re-election, except that two of the Vice-Presidents and eight of the Council shall retire every year.

16.—The business of the President shall be to preside at the Sessions of the Association; in his absence one of the Vice-Presidents, the President of Council, or the Treasurer, or any Member of the Council chosen by the Members present, shall take the chair.

17.—The President of Council shall preside at the Meetings of the Council, and in his absence one of the Vice-Presidents, the Treasurer, or a Member of Council elected by the Council for that purpose.

18.—The Treasurer, or some person appointed by him, shall receive all moneys due to the Association.

19.—The money in the hands of the Treasurer, which shall not be immediately required for the uses of the Association, shall be vested in such speedily available securities as shall be approved of by the Council.

20.—The Council shall lay before the Members, at each Anniversary Session, a report of their proceedings during the past year, and also an account of the receipts and expenditure of the Association.

21.—The Council shall meet at least once in two months, unless by special resolution to the contrary.

22.—The annual accounts of the receipts and expenditure of the

Association shall be audited by a Committee of three Members selected at the preceding Anniversary Session from among the Members at large.

23.—The Secretary shall have the management of the general correspondence of the Association, and of such other business as may arise in carrying out its objects.

SESSIONS.

24.—The Association shall hold an Anniversary Session, commencing on St. Andrew's day, or on such other day as the Council may determine. The place of such Session, its duration, and the business to be transacted, shall be arranged by the Council.

25.—The Members and their friends shall hold an Anniversary Dinner on the last day of each Anniversary Session, at such place and time as the Council may determine; the President for the year shall be in the chair.

26.—No alteration in the Laws of the Association shall be made, except at a General Session. Notice of the alteration to be proposed must also have been laid before the Council at least a month previously.

27.—The Council shall have power to call a General Session of the Members at any time, and shall also be required to do so within one month, upon receiving a requisition in writing to that effect from not less than twenty Members of the Association.

28.—All Special General Sessions of the Association shall be held at such place as the Council may appoint.

GENERAL.

29.—The Council shall have power to publish the proceedings of the Association, and to make such charge for them as they may deem right.

30.—The Council shall have power to order the name of any Member whose subscription is two years in arrear to be removed from the list of Members.

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ANNIVERSARY SESSION.

July 6, 1872.

The Sixth Anniversary Session of the Association was held at Willis's Rooms, King Street, St. James's, London, on Saturday, July 6th.

The President of the Association took the chair.

The minutes of the previous Session were read and confirmed.

Dr. Franklyn, Surgeon Major Royal Artillery; Dr. Finch, St. Mary Church; and Dr. Falls, Bournemouth, were elected Members of the Association.

Sir Alexander Armstrong, M.D., K.C.B., Director-General of the Navy Medical Department, and Sir Thomas Galbraith Logan, M.D., K.C.B., Director-General of the Army Medical Department, were elected Honorary Members.

The Officers and Council for 1873 were elected.

Dr. Frederick Davies, London; Dr. Crosby, London; and Dr. Bright, Forest Hill, were elected Auditors for 1873.

The Report of the Treasurer was read.

The Report of the Council was read and received.

The President of the Association, Deputy Inspector-General Gordon, M.D., C.B., delivered the Anniversary Address, "The Army Surgeon, his Work and Works."

Dr. Richardson, F.R.S., proposed, and Dr. Lyon Playfair, M.P., seconded, a vote of thanks to Dr. Gordon for his able, interesting, and instructive address.

The President returned thanks.

The Session was then closed.

ANNIVERSARY DINNER.

The Anniversary Dinner was held in the evening at Willis's Rooms. The President of the Association, Deputy Inspector-General Gordon, M.D., C.B., in the chair. Sir A. Armstrong, K.C.B., Director-General of the Navy Medical Department, and Dr. Halley, Treasurer of the Edinburgh University Club, honoured the Association with their presence as guests.

Transactions of the St. Andrews Medical Graduates' Association.

1872.

I.

BUSINESS OF THE ASSOCIATION AND COMMUNICATIONS IN CONNECTION THEREWITH.

REPORT OF THE COUNCIL.

July 6, 1872.

At the last Anniversary Session, held on December 1st, 1871, your Council were desired to consider the expediency of holding the Session in summer instead of winter. The change was urged on the ground that one great object of the Association, the cultivation of social intercourse and good fellowship, would be more effectually promoted at that season of the year, when Country Members were more able and more willing to leave home than in the middle of winter. Your Council trust that a largely increased number of Members present during the Session may be the result of the alteration.

During the year three Members and two Honorary Members have been elected ; one Member and one Honorary Member have died ; and six Members have resigned.

The Association now numbers four hundred and sixty-three Members, twenty-five Associates, and forty-five Honorary Members.

The losses by death are those of Dr. Sadleir of Liverpool, a Member of the Association ; and Dr. G. E. Day, an Honorary Member.

Your Council wish to record their deep sense of the loss which has been sustained in the death of Dr. George Day, and their sincere sympathy with his widow and children. For many years Dr. Day was Chandos Professor of Medicine in the University of St. Andrews, and, during his tenure of office, did good service in maintaining the interests of the University, and in enhancing the credit of its Medical Degrees. In 1857 he met with a serious accident, which practically disabled him from professional work for the remainder of his life ; he died on January 31st of this year, leaving Mrs. Day with means altogether insufficient for her support.

Your Council felt that the widow of a physician and scholar, who had done such excellent work as Professor Day, but who had been unable, by reason of physical infirmity, to provide for the future of his family, had urgent claims on the profession and the public.

In practical recognition of this claim your Council appointed a Committee to take steps to raise a Fund to secure better provision

for Mrs. Day, and certain other members of the profession were requested to honour the Association by joining the Committee, which was constituted as follows.

CHAIRMAN.—BENJAMIN W. RICHARDSON, M.D., F.R.S., F.R.C.P.

BELL, PROFESSOR, M.D., St. Andrews.
DUNCAN, J. M., M.D., F.R.C.P., Edinburgh.
ERICHSEN, PROFESSOR, London.
GORDON, INSP.-GEN. M.D., C.B., Dover.
GOSS, S. DAY, M.D., London.
PAGET, SIR JAMES, BT., F.R.S.. London.
ROBERTSON, J. LOCKHART, M.D., F.R.C.P., London.
SEMPLE, R.H., M.D., London.
SIEVEKING, E., M.D., F.R.C.P., London.
WATSON SIR T., BT., M.D., F.R.C.P., Lond.
WILLIAMS, A. WYNN, M.D., London.

HON. TREASURER.—J. H. PAUL, M.D. — HON. SECRETARY.—L. W. SEDGWICK, M.D.

Your Council have been much gratified by the response which has been made to the appeal of the Committee, £630 having already been subscribed; a sum which it is hoped will be still further increased.

The proposed alteration of the regulations for the Degree of Doctor of Medicine of St. Andrews, which has been several times before you, is still occupying the attention of your Council. In the present abeyance of medical matters in Parliament it has been thought better to postpone further public action till next year, and, in the meantime, by the circulation of the "Memorandum on Medical Degrees," to collect more knowledge of the injurious action of the present regulations.

The power of the University to grant the Degree of Master in Surgery as well as of Doctor of Medicine, has been brought before the University Court, and is found to be beyond the present powers of the University.

In the matter of the mode of taking Medical Evidence in Courts of Law, your Council have deferred taking further action, for the same reason as influenced their course in regard to Medical Degrees.

The very important Report of the Committee of the House of Commons on Habitual Drunkenness has been so recently made public, that your Council have not yet had the opportunity of giving to it that full consideration it so eminently requires.

Your Council are glad to know that the Registration of Disease, a subject which was brought to the notice of the then President of the Poor Law Board, Mr. Göschen, by this Association, in 1869, is at last receiving, at the hands of the Government, the attention which its importance to the community demands.

B. W. RICHARDSON, M.D., F.R.S., *President of Council.*
LEONARD W. SEDGWICK, M.D., *Honorary Secretary.*

TREASURER'S REPORT.

The Account of Receipts and Expenditure for the year 1871 has been audited, and found correct. The following is an abstract.

Receipts.	£	s.	d.	Expenditure.	£	s.	d.
Subscriptions of 1871	184	5	0	Deficit of 1870 paid off	22	9	5
Arrears paid up	28	10	0	Transactions & Postage	151	0	0
Payments in advance	5	15	0	Sundry Printing	11	5	4
Sale of Transactions	4	0	0	Stationery & Stamps	17	3	5
	£222	10	0	Publisher's Charges	6	9	0
				Advertisements	1	7	0
Balance due to Treasurer and Secretary	40	16	0	General Session, (Maidenhead)	2	10	1
				Anniversary Session and Dinner	19	18	3
				Clerk addressing Circulars & Transactions	9	0	0
				Sundries	0	9	0
				Presentation to Dr. Richardson	21	14	6
	£263	6	0		£263	6	0

The balance owing to the Treasurer and Secretary was, at the close of the year, £40 16s.; the amount of unpaid subscriptions, at the same time, was £68 10s. Had Members paid their subscriptions when due, there would have been a surplus of £27 14s.

J. H. Paul, M.D.,
Hon. Treasurer.

July 6, 1872.

Examined and found correct, Edwin T. Watkins, M.D. } *Auditors.*
W. B. Woodman, M.D. }

Note.—I am glad to add that at the close of the year 1872 the arrears had been paid off and that there was a balance in favour of the Association of £42.—L. W. S.

II.

COMMUNICATIONS ON MEDICAL AND SCIENTIFIC SUBJECTS.

THE ARMY SURGEON, HIS WORK AND WORKS.

By C. A. Gordon, M.D., C.B.,

Deputy Inspector-General of Army Hospitals,
President.

Fellow Graduates,

My first duty is most gratefully to acknowledge the high distinction the members of the St. Andrews Medical Graduates' Association have been pleased to confer upon me, in selecting me as the medium through whom they desire to manifest their goodwill towards their professional brethren in the army, for in this light only can I look upon the circumstance to which I owe the honour of now addressing you.

It is not often that a member of the military body is favoured as I am on this occasion. Our sphere of action is usually far removed from this great capital, our vocation very different from that of preparing addresses to read before learned and scientific associations, yet it is pleasant and flattering to us as a body to find that we are not altogether forgotten, that if out of sight we are not completely "out of mind."

It is true that novelists and popular writers have on some occasions been so good as to give, for the edification of their readers, a portraiture of the army surgeon. Thus, who has not laughed over the fussiness and irascibility of Slammer? Who has not been amused at the vagaries of Maurice Quill, who entered the 31st Regiment, to be near his brother in the 32nd, who, as surgeon of his distinguished corps, "was at the head of his profession," and, being so, had "nothing more to look forward to or expect?" Or do you accept as correct the picture conveyed in that very charming fairy tale, "The Water Babies," where the talented author tells us, that when Mrs. Be-done-by-as-you-did determines to call up before her all who have ill-used little children, and serve them as they served the children, "first, she called up all the doctors who give little children so much physic, and set them all in a row, and most miserable they looked, for they knew what was coming;

and first she pulled their teeth out, and then she bled them all round, and then she dosed them with calomel and jalap, and salts and senna, and brimstone and treacle," and so on? But then it is explained within parentheses, that those so treated were for the most part old ones; for the young ones have learnt better, all but a few *army surgeons* who still fancy that "a baby's inside is much like a Scotch grenadier's." Well! perhaps we have to wait until the baby developes into the man, "the soldier," now no longer "bearded like the Pard;" "full of strange oaths perhaps," yet who wins our battles and maintains England's honour, before we fully appreciate his "economy," interior and general. Babies, too, I may observe, like the red man who disappears before the march of civilization, are threatened with utter abolition, under the "latest thing out" in army re-organization, so that in regard to them, our occupation will soon be gone, it may be to their advantage, only the test cannot be applied; certainly to our comfort and peace of mind.

But I must endeavour to tell you a little of what our duties are, what we have done for the soldier and the profession, and what we have learnt from the great war so recently ended. A very few remarks will serve to explain the general nature of our functions, and of the interests confided to our charge. The great object of our existence as a department is to maintain the physical efficiency of England's armies, in connection with which duties, interests depend, more important than it is possible to appraise according to mere money value. Success or failure of a military expedition may depend upon a relatively small number of men, the more or the less ready and capable of being brought to bear upon a given point at a particular time; hence the obvious importance of preserving health under such circumstances.

Unhappily, experience has taught us that in protracted wars, large as has of late years been the list of casualties in battle, they are, to those by disease, but as one to seven, or even eight; hence the urgent necessity of judiciously arranged measures for the prevention of such diseases as we know to be incidental to active service. In all countries, except those that have the advantage of western civilization, whether an army be advancing or retiring, it becomes necessary to carry along with it, its sick and wounded, or at least take measures to protect them alike against the enemy and the population. Under such circumstances also the presence of a number of helpless men becomes a greater source of weakness than so many casualties in battle. In the one case, not

only must the men be fed and accommodated, but they must be carried; the men and animals employed in their transport, in addition to being similarly attended to, must be provided with means of protection, to the still further weakening of the force; while in the latter case no such arrangements are needed. Here, then, are conditions in reference to which our duties become of the highest importance. Let the fact also be borne in mind, that wars are now no longer carried on as they were even a few years ago. Where thousands of soldiers were wont to be engaged, tens of thousands are so now. The congregation of increased masses necessarily increases their liability to camp diseases, and thus vigilance on the part of the medical officers becomes more essential than it has hitherto been. While increased strength of military forces has become necessary, the money value of human labour has increased, as also the requirements of the soldier-yielding population of the country; hence the injury and hardship inflicted upon that portion of the people, by such calls as would become necessary to fill the ranks reduced by wounds and disease, would far exceed anything it has hitherto been, showing, were this necessary, that more than ever must we study by every means in our power to economise human life in armies. See also, the influence through the army upon the conditions of our civil population. Our recruits are selected lives, and being so, withdraw so much of the health standard; leaving in the persons of those rejected, the more or less diseased. The greater the number of soldiers thrown back upon civil life affected with disease, the greater the burthen they become to society, the greater the expense by reason of protracted sickness, and often crime into which they fall, and also the greater the injury to public health through the diseased children they propagate. Hence it is that the influence and vocation of the military surgeon, although chiefly exerted in the army, are by no means limited thereto, but pervade civil life to an extent greater, no doubt, than is at first recognised.

Not only does the surgeon in the army perform toward the classes under his charge the ordinary professional duties of his brother in civil life, but, in addition, a large number to which the latter is altogether a stranger; and, except in times of actual war, or during epidemics, the attendance on the sick, important and responsible although it be, forms really the least considerable of his many functions, while as he rises in the service, his duties bear more upon the management of masses than of individuals.

From the time and even before a young man joins the ranks of the army, until the moment he quits them, he is looked after and watched over, alike in health, in sickness, or when wounded, by the surgeon. It is the surgeon who tests his physical fitness for the arduous duties of military life, when as a recruit he comes before him, picking him as it were from the less sound of his fellows. During the irksome ordeal of training, the surgeon sees him from time to time, coming when necessary between him and the young man's instructors. When capable of taking his position among the effectives he is still watched over by his surgeon, who sees that his accommodation, his clothing, his food, are not only sufficient, but suitable, and that the recurrence of night duties on guard and otherwise, is not such as to impair health. When ordered on foreign service, the ship in which he embarks has been carefully examined by the surgeon, who has satisfied himself, in respect to space, ventilation, water, and food, that everything has been done for his comfort. During the voyage, the surgeon is present watching over him, and obliged by regulations to personally examine every soldier once a day, as also to see that all conditions calculated to preserve health are rigidly fulfilled. On reaching his destination, in whatever country or condition, the surgeon is present with him; and it is under such circumstances that the great responsibility of the medical man takes place, for now, whether it be service against an enemy or exposure to the more subtle and deadly spell of epidemic influence, the surgeon not only runs the same risks of exposure as do those of whom he has charge, but has in addition, when fatigued and often exhausted, to exert himself while they rest, and minister to the pressing needs of his stricken patients. Now also comes the real struggle between professional knowledge and death. Take for example, such diseases as heat-apoplexy and cholera in India. Decision on the part of the medical officer at the first onslaught, and they are readily combated. Pusillanimity and indecision for but a few minutes, and the affections bid defiance to any after skill.

In battle, a bullet drills its way through a limb, perhaps severs an artery, perhaps splinters a bone. The soldier drops confounded and panic-stricken. Still the surgeon is beside him, to stem the flowing life-stream it may be, to bind up the shattered member and see him sent to a place of safety, there to bestow upon him further care after the combat is over. And, may I ask, have you ever seen a stalwart soldier in the wild excitement of battle fall like a clod to

earth as I have related? If so, you doubtless appreciate my picture. If, as is more likely, your lot has led you to more peaceful spheres, your memory will probably recall the fear and anguish with which a woman in the throes of childbirth clings to her medical attendant. In no other conditions than those of the battle-field have I seen the counterpart, and yet men who know no better would fain believe that the surgeon is not needed while the fight rages. Not on the field of battle indeed! Who so instantly and loudly called for by the wounded man, soldier or officer, as the surgeon? What would be the effect upon those engaged, let me ask, were they without the knowledge that immediate aid was available? They would become demoralised were they but to suspect, that, once struck down, they should be left for an indefinite time untended and bleeding on the field. And it is our proud boast that never in this respect do we shirk our duty. That such is the case is demonstrated by the number of those among us who have earned the proud distinction of the Victoria Cross for valour in the field; a number at least equal in proportion to that among our combatant brother officers. It is not indeed by one set of men, or by one class of arrangements, that battles are won, but rather by the harmonious and efficient working of all pieces of the mighty military machine. As each in its own sphere conduces to the general result, so let it in all justice have its due meed of credit, and certainly that branch of which I am myself a *pinion,* is by no means the least important.

Then comes the terrible and anxious work of war hospitals. These establishments are selected, arranged, and provided with *personnel* and *materiel* under the orders and superintendence of the senior medical officer, their position being determined with reference to the nature of the service on which the army is engaged, and the position of the force with reference to its base of operations. Often also suitable means of transport for the wounded have to be procured or improvised, and who so fitted as the surgeon to make the selection with reference to the nature of injuries, the description of roads over which the wounded have to be transported, and distance to which they have to be conveyed? Intermediate posts have to be selected *en route*, means being provided at each for supplying the wounded with temporary accommodation, assistance, and food; or, as now practicable, railway trains can be fitted up, the duty of selecting suitable cases for removal, and providing professional attendance, rests with the medical department. Other

duties, no less important, occupy the attention of the medical department on active service. Individual sick and wounded have to be treated; such means as are practicable devised for protecting the health and consequent military efficiency of the troops; the general in command kept informed as far as possible of the number of those in hospital whose restoration to health may be anticipated after a certain time, of those who are permanently unfit, and, with reference to climate and other conditions of the country or district where hostilities are being carried on, the casualties that may be expected to arise by sickness, to enable the commander to estimate the numerical strength of reinforcements required to fill up the inevitable losses.

Much is said in military circles on the vexed division of the military services into combatant and non-combatant. In one sense, and that a very important one, who so entitled to rank among the former as the medical officer, whose whole career is passed in combating enemies of humanity, whether they be physical and open as the "arrow," the shot, the shell in the day of battle, or hidden and mysterious as the epidemic, the exhausting sickness, the pestilence that walketh in darkness? No wonder, indeed, that such enemies thin our ranks and maim the survivors, in health, if not in limb; accordingly, statistics of campaigns show that death is then busiest among the medical officers, among whom a larger proportion perish than among their regimental brethren, and including the casualties of battle.

Let the fact, moreover, be borne in mind, that on foreign service, not only have soldiers individually and in the mass to be attended, as I have endeavoured to indicate, but so have their wives and their children. Officers and their families are no less dependent upon their regimental surgeons. They can no longer take train to this great city to consult an eminent or fashionable man of the day, nor indeed would such affections as those from which they suffer, more especially in the more unhealthy regions of the tropics, give them time to do so. Thus, in their persons, lives and interests of the highest national importance are for the time being in the hands of the army surgeon; and, may I add, the responsibility of the charge is, sometimes at least, unequalled by the recognition awarded to it.

One more remark on the duties of the army surgeon. We shall suppose him and the troops under his charge returned to the United Kingdom, both, as is often the case, individually less active

and robust than when they left it. Soldiers unable longer to perform military duty must be weeded from the ranks to maintain their battalions fit for the eventualities of military life. Some have ailments, which, although as yet slight or obscure, will ere long unfit them, not only for the army, but incapacitate them from earning a livelihood in civil life; others, although suffering it may be from active disease, the result of climate and service, may be expected after a certain time to recover; while a third class, although unable to perform the duties of a soldier, are capable of labouring for their own maintenance. It becomes the duty of the medical officer to discriminate between all these, and having done so, to prepare his report in regard to each individual, so as to guide the commissioners charged with the bestowal of pensions to adjudicate in such a way, that, while bestowing upon persons what their special services and circumstances entitle them to, the interests of the British tax-payer shall be at the same time considered.

Here I may observe, that in the performance of this duty of weeding the army of inefficient men, the army surgeon sometimes undeservedly finds himself the subject of remarks the reverse of flattering. Thus there are many men, who, although unfit for the duties of a soldier, are quite able to earn their living partially or entirely in civil life; accordingly it is by no means rare to meet with old soldiers, hale and hearty, some of whom, it may be, had undergone a surgical operation or been treated for a certain time in a civil hospital, and then discharged completely cured, notwithstanding that "the regimental surgeon could make nothing of him," for such is the ordinary comment. The explanation is easy. We must study the general efficiency of the whole machine. To ensure this, it is often necessary simply to replace a permanently injured fragment of the apparatus by a perfectly new, rather than patch and tinker that, which never more could work satisfactorily in itself, or smoothly with those other cogs and wheels of immediate and co-ordinate action. So also if there is little or no prospect of a soldier being restored to military efficiency by protracted hospital treatment, the general interests of the service are adverse to his being retained upon the rolls of his regiment. Many men there are also, who, whether their alleged incapacity be real or assumed, are alike unsuited to the army, and simply because, if they insist upon it, they will not perform their duties satisfactorily; they tell the surgeon they are stiff and rheumatic, that their former activity is gone, and the surgeon very properly takes their word for it. Such

men, not of the very highest standard of truthfulness or morality, are not unfrequent visitors of civil hospitals. They soon learn to relate to surgeon and students sensational accounts of imaginary adventures. The army doctor, like his brother in civil life, is often a ready scape-goat, and as with the one, so with the other, very undeservedly so.

The history of wars furnishes several illustrations of the influence for good or bad, in respect to the general interests of an army, exercised by the medical department. That of Italy in 1859 gave examples of insufficiency of surgeons as regards number, and inadequacy as regards professional capability, the results being, on the one hand protracted exposure of the wounded without assistance, and on the other attention which, when rendered, was scarcely less dangerous and injurious than its total absence. During the civil struggle in America, if we are to believe the author of *Battle Fields of the South*, the losses of life among the wounded through insufficient and improper surgical help, is given a place among the causes which led to the collapse of that army. If we look at the late great war upon the continent, also, we meet with records of evils arising from insufficient surgical arrangements in *personnel* as in *matériel*. Thus we learn from accounts by correspondents and others on the spot, that, notwithstanding all that was done by the Governments and by Societies, the wounded could not in all instances obtain sufficient nurses. After Sedan, this was especially felt; nor were the wounded able to obtain, while in transit, those articles of nourishment of which they stood so much in need.

After the battle of Gorse, with five thousand four hundred wounded, M. Langenbeck had only four medical officers to attend upon them, during the two days that elapsed before the arrival of the Sanitats detachment. After the battle of Gravelotte, a quarter of the wounded on the French side is said to have died; this catastrophe being attributable to defective means of transport, and to the want of first dressings. Many are said on this occasion to have passed two days and nights on the field, and, after that ordeal, to have been transported to Pont à Mousson, where for the first time they found assistance in the temporary hospitals established there. Again, the state of Lagny during December is said to have been beyond description. A thousand and upwards of wounded poured in day after day, their wounds needing to be dressed, themselves to be fed; no hospital in the place, but sheds, railway vans,

the station, church, and mairie, all, for the time being, occupied as such.*

If we retrace our steps to by-gone times, we find it recorded, that so long ago as 1742, the efficiency of the Duke of Cumberland's army in the Low Countries was directly due to the talent and success with which Sir John Pringle applied hygienic measures to prevent and mitigate typhus and other diseases, the result of crowding, dirt, and bad food. According to the history of the Peninsular war, the Duke of Wellington, before making his successful attack upon Badajos, confided his plans to Sir James McGrigor, his principal medical officer, and to him alone. The latter was able to send the sick, wounded, and impedimenta to Elvas in the rear, where suitable provision was made for them. The army was thus rendered light and active, and with it the great commander struck his blow. So it was at Vittoria. The duke had rapidly to attack the French. He "took stock" of his available force, and found it far inferior to that of the enemy. He consulted his chief surgeon, one of whose qualities was, that he kept count of the probable numbers who might be calculated upon to return to the ranks. This time the knowledge was acted upon. From various hospitals between five and six thousand men able to bear arms were pressed onward, and, with his army thus reinforced, the most signal victory of the Peninsular war was gained. Without those reinforcements that day must have been lost to our arms. As a contrast, permit me to remind you of Walcheren. You all know the history of our expedition to that island in 1809. The causes of disease were rife. Sir James McGrigor and Sir William Burnett, the medical heads of the land and naval forces, jointly drew up a code of hygienic rules, equal, it may be observed, to any of the more modern and scientific. Those instructions, however, found no favour in the eyes of the commanders. They were consequently unapplied. The expedition came absolutely to nought. The following year, a parliamentary investigation into the miscarriage took place; and in the proceedings of that commission you may still read, that, in the opinion of the commissioners, had the instructions of the medical officers been followed, thousands of lives and tens of thousands of pounds sterling would have been saved to England. Perhaps in our day, the hygienic recommendations of responsible authorities dared not be ignored

* M. Hecht in the *Gazette Médicale de Strasbourg;* also Forbes, vol. ii. p. 196.

by commanders, as they were in the days to which we have just referred. The present very advanced state of public opinion would doubtless check the evil in its bud, or, at any rate, before its full development; nevertheless, have we not as a body the right to ask, whether, our functions having as I have just pointed out so enormous an influence upon the efficiency and consequent success of armies, we are not justly entitled to receive a measure of consideration proportioned to the importance of the services we perform?

Unhappily for ourselves, we for the present occupy a sort of no-man's land. When public recognition of civil medical services is on the *tapis*, we learn in a very marked manner that we are in the army. When for military services before an enemy, we are reminded that we are "doctors." It has not been so always; neither will it be. There was a time when military commanders and authors wrote of army surgeons in terms which the poet transposes :—

> "A wise physician skilled our wounds to heal,
> Is more than thousands to the public weal."

History repeats itself. The time *has* come when the services rendered by army surgeons more than ever merit the delicate paraphrase of Pope.

May I be permitted to allude very briefly to some of the ameliorations in the condition of the soldier, mainly or altogether due to the medical officers of the army?

It is not so long ago, since the sleeping places of our soldiers consisted of a series of shelves, arranged in double tiers along the sides of their barrack room, like bunks on board an emigrant ship of the olden time. On each such shelf two, and in emergencies three, men lay side by side; the recruit just joined, filthy and often diseased as he was, was accommodated in the first berth that happened to be vacant; when a soldier went on guard, his place was taken by the next who happened to need a bed; and he on his return from his turn of duty was similarly disposed of. Truly the soldier of those days had many strange bedfellows; nor were they of his own seeking.

Need we wonder that typhus and eruptive fevers were rampant in the army, and cutaneous affections all but universal among the soldiers? This system, injurious alike to the *physique* and *morale* of the soldier, was abandoned in consequence of the loud and

long continued protests of the army surgeons; and the paragraph in their regulations, as those stood prior to 1859, now read strangely—that every man should have a separate bed. Will you believe it? what has long since been banished from the army still lingers in the militia—one *billet* is even now taken for two militia men! Means of personal ablution were perhaps upon a par with the sleeping accommodation; so much so that satirical writers were wont to describe the process by which the British grenadier performed his morning toilet—taking a mouthful of water, then squirting it into his hands, he thus washed his face. How he dried his manly countenance is not recorded in history, but as to to his dandriff-covered person, his gorgeous uniform compensated for and concealed all that. See now the ablution and the bath rooms erected in every barrack for the soldier. Recollect, that, while all that has been effected in both respects has been so on the urgent recommendation of army surgeons, very much more would have been done, in these and other respects, had more than a tithe of their recommendations been carried out.

In regard to food, the abolition of the old system, whereby soldiers on foreign stations were restricted to salted provisions almost as completely as if they were on board ship, was effected after years of protest on the part of army surgeons; and good as the present fresh ration is, it would have been still better had full scope been given to their recommendations. As regards appropriate diet for the sick, even so lately as the end of last century a soldier while under medical treatment, let us say on account of dysentery or yellow fever in the West Indies, received, as diet and support, his regular ration of salted pork and rum, for in those days spirit drinking was compulsory on his part. Our present improved system is due to the representations of army surgeons, some of whom, notably Dr. Robert Jackson, had introduced suitable scales of diet into their hospitals before the system was sanctioned by regulations. It was an army surgeon, namely Dr. Hamilton, who first protested against the extent to which, in by-gone days, the barbarous and degrading punishment of the lash was carried in the army. He did even more than this. He pointed out that many offences are committed by soldiers from sheer ignorance of the code of laws under which they serve, and condemned the nomenclature according to which crimes and offences are enumerated in establishing what is called a *regimental* character; offences merely against military usages and rules being to a

certain extent placed upon the same footing as those against person or property.

With reference to other matters of general hygiene, we need but refer to the works of such men as Pringle, Monro, Jackson, Bell, and Ballingall, to read in their pages the very principles in regard to barrack and hospital construction, the proper size of rooms, and appropriate sites for these buildings, which we find of late years paraded, with all the aspect of originality, in works by so-called sanitary reformers; the opinions, if not the very words, of the army surgeons being given, but not a syllable as to the source from whence the plagiarism had been made. I have indicated the principal old army writers, so that you have it in your own power to test the correctness of my statement, and prove for yourselves whether or not the labours of my military brethren have received in these respects the recognition justly due to them.

Some diseases have, it may be said, been abolished in the army, through the exertions of military medical men. Typhus fever, for example, which, even so lately as the days of the Peninsular war was literally *the* army disease, to such an extent did it prevail, is now next to unknown; dysentery of a severe type is never now met with except in the tropics; and scurvy is all but unknown, except under very unusual circumstances. So also with small-pox: the care with which vaccination and re-vaccination is performed, and other hygienic measures adopted, has brought cases of this disease to their minimum among the troops. The efficiency with which protective measures are employed have rendered such a thing as a general epidemic of infectious disease, scarlatina for instance, unknown; and although, unhappily, means have not yet been discovered to similarly exclude cholera, when that dire malady sweeps over a military station as it does in India, nevertheless by removing the troops away from the locality to a more healthy district, a great deal has been achieved to diminish its ravages. This measure, adopted first with regard to yellow fever in the West Indies, was practised in India so long ago as 1825, and yet to judge from recent printed statements, the measure would seem as but of yesterday. In both cases its authors were army surgeons. Many other sanitary improvements of the greatest importance to the soldier, have been introduced by army medical officers; many more would have been so had their recommendations been fully acted upon. Yet, what is by no means encouraging, is the fact, that in comparatively few cases are the names of their actual originators mentioned in con-

nection with them. You hear that such and such improvements were introduced by *Lord* This or *Lord* That; but who ever hears a word about the pertinacity with which the necessity for them had been urged by Doctor So-and-so?

Turning to matters more purely connected with curative medicine and surgery, permit me to allude to a few improvements effected by army surgeons. As they were the first to study the diseases peculiar to the tropics, such as yellow fever, cholera, liver disease, dysentery, and sun-stroke, so the first advances made in the treatment of those affections were inaugurated by them. They also it was who first gave to the profession connected accounts of the etiology and pathology of those affections. Syphilitic diseases were, from the nature of circumstances, more especially brought under the notice of military surgeons. The ravages of those affections, far greater than they have in our day been, were first counteracted by them; and if at one period mercury was pushed to an extent that would now be deemed unjustifiable, they it was who instituted comparative statistics in regard to the relative success of various means of cure, thus laying the basis of our present *improved* method of treating what now seems to be a much modified form of disease. To army surgeons the profession is indebted for the first protest raised against the extent to which in former days calomel was administered in the treatment of diseases of the tropics, and the late Dr. Mackintosh—himself, by-the-bye, an army surgeon—tells us, how the first medical officer in India who protested against the then prevalent practice of profuse salivation, was not only placed under arrest for entertaining heretical opinions, but it is to be feared had his prospects for ever blasted, as an encouragement for his brethren. So also with the old system of profuse bleedings. The first note of alarm in regard to the practice, so far as I can learn, was sounded by an army surgeon, a very remarkable man, notwithstanding his somewhat Quixotic tilt against "The Fallacies of the Faculty." That note was taken up by Inspector-General Hume, who is still alive, and who, in a work published about 1840, showed some of the abuses attendant upon the system.

With regard to the treatment of gunshot injuries, army surgeons have naturally monopolised, at least to a great extent, this kind of wounds. The teachings of the Peninsular war in regard to them have been enumerated by Sir Charles Bell and Mr. Guthrie; many of the principles laid down by them being confirmed by the more recent experience gained in the great war so lately ended. I

allude more especially to the necessity for securing a wounded artery above and below the seat of injury, the treatment of penetrating wounds of the chest, and the question of primary and secondary amputation. With regard to individual operations, it is at once allowed that almost all the improvements in their manner of performance have come from our civil brethren. We as a body can only claim to have adopted them. Permit me to observe, however, that the hurry and confusion of active service, or the surgery of war hospitals, scarcely afford conditions under which to practise experimental methods, for our surgery, like the conditions in which we are placed, must be somewhat rough. But, let me add, it must be ready as it is emergent.

It would be unbecoming in me, and unjust to the memory of the greatest of all surgeons, military or civil, did I not make one brief allusion to John Hunter, although to you who know so well the literature of his works, it is unnecessary to pass all in review. In 1793 this great man occupied the position of Director-General of the Army Medical Department, and re-organized the medical arrangements for the army, then being assembled for service on the continent. With regard to his works on the blood, inflammation, and gunshot wounds, his researches in regard to syphilis, his improved treatment of aneurism, and his labours in elucidation of our common science, all of us are alike still willing to pay him homage. It may not be out of place to remind you, that this army surgeon has been justly described as "the greatest man in the medical profession, either in ancient or modern times;" that in 1759 he entered the medical service of the army, in 1762 accompanied the forces engaged in the war with Spain, in 1786 became Surgeon-General, and at the time of his death was fulfilling the important duties connected with the position of Director-General, as well as the highly honourable position of surgeon to St. George's Hospital.

The limits within which my remarks must be compressed prevent me from further enlarging upon this part of my subject, being anxious as I am to glance at a few of the lessons to be gathered from the late great war upon the Continent. Many of those lessons are of great value, not only to the army medical officer, but to the practitioner in civil life; involving as they do points of immense importance in regard to the management of individuals when suffering from wounds or operations, or when prostrated by diseases incidental to campaigns or by those affecting the general conditions

of the masses. I can pretend to no more, however, than to solicit your attention to a few out of the number.

With regard to hygienic measures, the experience of the Franco-German war indicates three very remarkable circumstances. Within besieged Paris, for example, great as the mortality continued to be throughout the winter of 1870-71, and rife as were the causes of disease in operation—including a condition of semi-starvation, insufficient fuel, physical and moral depression, together with the prevalence of epidemic diseases among the populace—such was the energy shown by the health authorities, and the discretion of the measures dictated by them, that the death-rates were maintained at a mere fraction of what they had been, not only on the occasion of the previous siege of the same capital in 1590, but also of those of other sieges in more recent times. So it was with other French cities, as Metz and Strasbourg. So also it was among the besiegers of those places. On former occasions, history tells us that the forces investing a city suffered by disease to an extent only in a degree less than those invested; and, with regard to Metz, that a former besieging army—that of Charles V., in 1552—had actually to withdraw in consequence of the frightful ravages of disease in its ranks. But all this has now been changed. The observance of hygienic principles has enabled commanders to maintain a besieging army in a state of physical efficiency equal to that enjoyed by troops in ordinary quarters. But, and in the second place, it has been demonstrated that circumstances may arise in which the existence of one radical defect may neutralise all the best directed efforts of hygiene, so long as that cardinal defect is unremoved. Thus, all the measures that it has been possible to take have failed to neuralise or compensate for the evils arising from the adoption—as hospitals for wounded—of buildings unsuitably constructed; of those occupying defective positions; and of those, let me add, that have been impregnated with human emanations, such as churches, ball-rooms, hotels, theatres, and so on. In none of these were hygienic measures capable of preventing the occurrence of hospital diseases. In the third place, there have occurred during the late war, as in previous campaigns, and as there must be in all, occasions on which the pressure or necessities of military operations for the time being supersede all questions of hygiene. A military end has to be attained, a rapid movement effected; the sacrifice of a certain number is inevitable; it is taken into account, and while the movement is being effected there is neither time nor room for hygiene.

We have learned that it is unsafe to draw conclusions from observations made under one set of conditions, and to apply them in emergencies of a totally different nature. Thus, in civil hospitals, where the establishments are not only themselves arranged with the greatest care and completeness for their purpose, the staff numerous and perfectly trained, but the cases under treatment at any one time inconsiderable in number, the rules, there suitable, cannot safely be applied to extemporised war hospitals, established in unsuitable buildings, often with few and imperfectly trained attendants; with food, clothing, and cleanliness limited; and with wounded being brought in large numbers for assistance, as is the case after a modern battle. Neither, again, would rules of treatment, suitable in establishments such as these, be applicable where wounded had to be carried with their several forces, whether advancing or retreating; or where from circumstances it was necessary to have them transported to a great distance. Nor must I omit to observe, that the general arrangements for the wounded of armies, which are suited for civilised countries, are totally inapplicable in operations against an uncivilised enemy, or at least one whose civilisation is not according to the western model. In the one case, the civil population have ever shown themselves ready to extend help to those disabled in battle: a wounded soldier has long ceased to be an *enemy*, his life is held sacred by foe and friend alike, and now he receives the additional security of the Red Cross of Geneva. Left wherever he may be, alike in the hands of the hostile forces, in an enemy's country, or upon his own natural soil, he is sure of care. How different all this would be, say in India, in Africa, or in New Zealand! We have, alas, too many instances where the wounded, during late wars, were barbarously put to death by those enemies into whose hands they had unhappily fallen. It is therefore obvious that arrangements for their protection, unnecessary in the one case, become matters of absolute necessity in the other.

Another point of great importance seems to me to have been indicated in the late war. The Prussian Government had sent with particular *corps d'armée* one or more surgeons of eminence, whose duties were merely consultative, the venerable Stromeyer being among their number, and their chief. The nature of the services rendered by these men is acknowledged to have been very great, and seems to me to indicate the propriety of a similar plan being adopted in our own army when next engaged in war. Men of

great experience among war hospitals would, in such a case, be invaluable merely for their opinions in regard to the suitable treatment to be followed in particular cases, relieving the *executive* surgeons of much responsibility, and would doubtless be the means of saving many lives. Thus it is only necessary to indicate how important would be the results were it authoritatively said, "Treat that limb conservatively," or "Time will be lost if you attempt to save it," "This man, wounded through the chest, may recover if retained where he is," "That man must be transferred elsewhere," and so on.

Adverting to questions of a more purely professional nature, many important lessons have been learnt, and teachings of former campaigns confirmed, by the late war. Let us take conservative surgery as an example in point. Unfortunately the rate of mortality was very great among the wounded; it was very large among those who had been subjected to operation; but so it was, with very rare exceptions, among those who were treated conservatively. As a rule, it may be said that a more numerous and better trained staff is required for the successful practice of conservative surgery than for that of a more radical description. It would seem that the risks of hospital diseases are increased by attempts at preserving shattered limbs; that in many instances secondary operations have to be performed while the patients are in an unfavourable condition; and that for any other than stationary hospitals this method of procedure is, as a rule, unsuitable.

I have already alluded to the lessons we have learnt from the late war in regard to penetrating wounds of the chest. In cases where the wound implicates the upper portion of a lung, and has gone clean through, or otherwise escaped from the thorax, we would not now despond, but rather treat the patient with a considerable degree of confidence as to his speedy recovery. We would hermetically close both openings of the wound; would place the patient in a hut or tent where the temperature admitted of being regulated; would in the first instance direct our measures to the state of more or less collapse or *shock* into which a man thus wounded is sure to fall; would combat reaction some forty-eight hours afterwards; and finally, in due time, support and nourish our patient, keep him quiet, but at the same time cheerful.

In cases of wounds in the near vicinity of the large joints, our first consideration would be, Can an apparatus be so applied as to immobilize the member? our next, Can our patient be treated

under conditions of a nature to render conservation probable? In a gun-shot fracture of the femur we would in like manner ask, What are the conditions under which the patient may be treated? and having ascertained them would now have relatively little difficulty in deciding upon the method of treatment to follow. And what about that very vexed question—gun-shot wounds penetrating the knee joint? I think that although during the war some instances have undoubtedly occurred in which life and limb have been saved, the general conclusion arrived at is that immediate amputation is, as a principle, the plan of treatment to follow. With regard to excisions of joints, the results of operations in cases of disease occurring in metropolitan and other civil hospitals give no safe indications of what those in war would be. Take for example, the knee joint: it may now be taken as conclusive that for wounds in battle excision of this articulation is no longer justifiable.

In regard to the very important subject of hospital diseases, the experience of the late war and enquiries arising out of it, in France, in England, and elsewhere, have done more to give us a clear insight into their etiology and pathology than we have hitherto possessed, and thus the better enable us not only to treat them when they occur, but to guard against their occurrence among the wounded. M. Demarquay, in Paris, has in a manner made this investigation his own.

Finally, I would briefly enumerate, as they were written at the time, a few of the other lessons to be gathered from the great drama so recently enacted, confining myself to that portion of it with which I was more immediately connected—namely, the siege of Paris. These lessons are:—

In all arrangements having reference to war, the requirements of the wounded demand pre-eminent attention.

The necessity and importance, in a public point of view, of the highest professional skill, the best attendance and attendants that are available, have been demonstrated.

The importance also, in a public point of view, of the services of surgeons made itself apparent during the siege, and was then frankly acknowledged by the authorities, civil and military.

It was well known that a considerable amount of the mortality in hospitals was the result of administrative power being in the

hands of non-medical persons; and demonstrated that those conditions required to be altered on future occasions, that all the needs and necessities of sick and wounded men should be controlled and ministered to by professional men.

The superiority of huts and tents over permanent buildings as hospitals gives rise to the question whether, in the event of its being possible on future similar occasions to use these alone, this ought not to be done.

The want of properly trained *brancardiers* for the removal of wounded men having been the cause of much suffering to the latter, it is incumbent to have for the future specially instructed men for this purpose, as well as for attendance on them in hospital.

It is moreover essential for the comfort of the wounded that the carriages used for their transport from the field of battle to the hospitals should be of the lightest description compatible with strength, their springs of the best material, elastic and in all respects well finished; and that the conveyances be well horsed, so that injured soldiers may be conveyed as rapidly and with as much ease as possible to the hospitals provided for them.

But I must have done. I have in my review carried you over a considerable variety of subjects. I have looked at each in turn from the point of view in which it concerns the military members of our profession; and if in all cases the points to which allusion has been made have perhaps not been within the sphere of our brethren in civil life, they have, I would fain hope, indicated to you the extensive programme it is necessary that the Army Surgeon should make himself acquainted with, in order that he may efficiently perform the high duties that fall within his province; duties responsible and important in themselves: on the one hand affecting the efficiency of our army, on the other involving the highest aims of our common profession, in combating disease, in ministering to the wounded, often in times of greatest peril, and in helping, as far as in us lies, to reduce the amount of bodily suffering and misery among the classes of the community with whom we are associated.

UNIVERSITIES IN THEIR RELATION TO PROFESSIONAL EDUCATION.

By Lyon Playfair, LL.D.,

Member in Parliament for the Universities of Edinburgh and St. Andrews.

Though I am not permitted, as a Member for a University, to appear before you in the capacity of a representative addressing his constituents, I can still, as a graduate addressing his fellow graduates, select a subject of public interest. The subject of my address is the position which Universities should occupy in relation to Professional Education. It has recently been the custom to state, especially in debates on the Queen's Colleges in Ireland, that Universities ought not to be places for professional instruction, and that, however numerous students for professions may be, the success of Colleges should not be measured by them, but only by such students as pass through the curriculum of the Faculty of Arts. This assertion is made in total ignorance of the origin of Universities, and of their duties as instructors of all who have occasion for learning, and not merely of the wealthier classes of society. The older Universities did not spring from kings or popes, but had their origin deep down among the professional classes. The latter wished to glorify their professions by raising them above mere empiricism. This could only be done by rationalising and generalising the facts gathered by experience. Hence Universities could not spring into being with a completed organisation, panoplied in their armour, as Minerva did out of the brain of Jupiter. At first they were mere schools, which slowly developed into an academical form; for it was not till the twelfth or thirteenth centuries that they assumed their present University state. Salerno is one of the most ancient and illustrative instances of this development.* We do not know how long a medical

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* See *Christison*, "Graduation under the Medical and Scotch Universities' Acts," 1861.

school flourished at Salerno, but there is evidence of its existence in the tenth century. In the middle of the eleventh century Monk Rodulf visited it, and what is curious, in its relation to female education, found no one so learned as himself, except a learned lady. Salerno was even then a well-known school of ancient date, for it is described "in urbe Salernitana ubi maximæ medicorum scholæ ab antiquo tempore haberent."* It was a century later, or in 1140, that Roger, first King of Sicily and Naples, directed his attention to Salerno, and gave legal force to its own consuetudinary statutes.† His grandson, the Emperor Frederick the Second, in 1231, threw a net over the school, for he assumed power to give a State impress to Salernian medical degrees. This seems to have been the origin of the claim made by the State to secure the qualification of medical practitioners; and, though his statutes were abrogated by Queen Joanna in 1365, it is interesting to know what they were. The Roman Emperor claimed a sort of *veto* over the graduations of Salerno and Naples, because he ordered the graduates who had passed the *magistri* of these schools to come "before ourselves, or, in case of our absence from this realm, before our vicegerent, and receive from him a license to practise." Except that there does not appear to have been an examination, this practice is identical in theory with the *Staats Examen* of the German States. But both are radically different from the "one-portal" system which has been advocated in this country, and regarding which I shall have a good deal to say hereafter. At present our point of attention is that the old Universities arose out of the needs of professions; that in their development they acquired consuetudinary rights, which the State subsequently made statutory, and finally controlled. As Salerno arose out of medicine, so did Bologna arise out of law. Round the law school of Bologna other professional schools gradually clustered, until it assumed a University form in the middle of the twelfth century. But, even beyond 1360, the separate professional schools maintained their independence, and granted their degrees; for there were actually four degree-conferring Universities at Bologna —two for law, one for medicine and philosophy, and one for theology.

The University of Paris had its origin in a school of theology,

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* Quoted by *Bulaeus*, "Hist. Univ. Parisiensis," i. 478.

† *Ackermann*, "Regimen Sanitatis Salerni," 1776, p. 42; see also *Giannone*, "Istoria Civile del Regno di Napoli," i. 188.

but, subsequently becoming remarkable for its philosophy, attracted a large number of students of all ages. Faculties of medicine and law then grouped themselves around the original theological schola. When provincial Universities arose in France, they sometimes took up a single profession, and even now we find this tradition preserved, as a survival, in the separate provincial faculties for medicine, law, and science, which still exist in France. For the *Studium generale* of the old Universities did not mean that all studies were taught, but only that certain studies were taught to all. It was only after Universities had grown into importance, that popes or kings threw the mantles of the Church or State over them; though they did not attempt to lessen their position as places for professional training. The newer Universities were founded by royal charters or papal bulls, and generally included faculties for philosophy, theology, law, and medicine; though not always, as instanced in the migratory University for theology and canon law founded by Innocent IV., or the partial Universities of Altdorf, Rostock, Bamberg, and Gratz. Sometimes, as in St. Andrews, the faculty of arts was external to the professional faculties, and even extramural in position; for then it was a mere pedagogium, or preparatory school for the professional system. It is difficult to say how soon the arts teaching became on a level with the other faculties. In the University of Paris the higher and lower classes of instruction seem to have run together, for children as well as youths were among the *cives* of the University. Thus we find a curious old statute of the University of Paris enjoining all students to refrain from passing through the faculty of arts till they were twelve years of age. This mixture of ages produced strange results, as instanced in the flogging of Bacon at Cambridge, when a mere boy, and of Ignatius Loyola at Paris, when thirty years of age. In the thirteenth century the same mixture of men, boys, and children, was found in the English Universities; but, even then, the faculty of arts was rising in importance, as we see in the conflicts between the realists and nominalists, although they had not the dimensions which they assumed under Duns Scotus in the beginning of the fourteenth century. That struggle was like the one now impending, for the realists wished to travel by the *Via antiqua*, and the nominalists by the *Via moderna*. It is very likely that, at Oxford and Cambridge, the importance of the faculty of arts asserted itself sooner than in other Universities. For, though civil law was taught by Vicarius in the middle of the twelfth century at Oxford,

along with canon law and theology, and soon after with medicine, yet the philosophical faculty early emerged into importance. Ultimately, professional teaching at Oxford and Cambridge became subordinate to teaching in arts, which is now looked on as the end, instead of as the beginning, of University life. But recollect that this is a peculiarity confined to our great English Universities. Now, as you are aware, they have almost wholly let slip the main object for which Universities were founded—to liberalise the professions—while instruction in arts has become their chief end. Hence also they lost their hold on the people, as a whole, and became the Universities of the rich. That was not the case in their early days, when poor scholars begged from monastery to monastery till they reached the seats of learning from all parts of the kingdom; nor was it so even when Bishop Latimer was an undergraduate, for he tells us that many yeomen were among his fellow students. Though Oxford and Cambridge have thus exaggerated the importance of the faculty of arts by making its degrees and honours the end instead of the beginning of University life, the very existence of such a faculty is the foundation and justification for professional training in Universities. It is the power of liberalising the professions that distinguishes Universities from technical schools. The latter are too apt to look to the more practical ends of professional life, while the former bestow more attention to the scientific foundations on which practice should always be built. The importance of infusing liberal culture into medicine has induced our medical legislators, within the last few years, to insist on a preliminary examination of students before they begin their medical studies. Notwithstanding this, how seldom do we find the seal of the faculty of arts impressed upon medical graduates. In Dublin University an M.D. must be a graduate in arts, but, in the Queen's University, and in the Scotch Universities, the possession of such graduation is the exception and not the rule. Let us carefully examine into this rarity of methodical academic training among our professional men. In the early constitutions of our Universities, the faculty of arts was the preparatory pedagogium of the priest, the lawyer, and the doctor. The subjects embraced in it were selected for their use. At that time the common language of the learned classes was Latin, in which they thought, spoke, and wrote. All the professional treatises were written in the language of Rome. When Descartes wrote in French his famous work on Method, the innovation was thought so great that it was at once translated into

Latin. In Scotland Dr. Gregory was the *Ultimatus Romanorum*, as he had to apologise for writing in Latin, a language which his professional brethren had nearly ceased to understand. Classical instruction, until then, was necessarily made the basis of educational training. In itself it was a renaissance, and was at the same time a revolution of the scholastic system of education, which still feebly struggled on till the Reformation. The scholastic system was long supported by its subservience to theology, "philosophia theologiæ ancilla." It was then that Protestant Universities renounced the necessity of an arts degree for study in the professional faculties, because the controversies of the scholastic system were so unprofitable. But classics replaced it; for Latin orations and Latin composition became as necessary to professional men of former times, as English speaking and composition are to those who practise at the present day. Our Latin and Greek education still goes on, though, for its practical uses, it is as much a survival as the two buttons behind our coats are survivals of the time when the slits and flaps of our ancestral coats had to be buttoned away. Their existence survives their utility. Medical men no longer write or speak Latin, and yet a fourth of a professional man's life is spent in the venerable deception that it is indispensable to him. In fact the only thing that is left of it is that queer survival of writing prescriptions in an abbreviated mongrel Latinity. So the professional man, after spending a fourth of his life at school in learning that which he little uses in after life, naturally has little disposition to go through a further course of it in the faculty of arts of a University. Yet the latter still runs slowly on the old and worn-out grooves of a system originally framed to aid the professions, though these now run along new courses altogether. The advocates of the old classical system of education only claim for it an indirect utility as a means of culture. It has been likened to that old system of husbandry, when green crops were grown, not for their direct use, but only to be ploughed into the land for future useful crops. Such a system is too irrational for modern agriculture, and may be of doubtful wisdom for mental culture. If liberal culture be, as it should be, a part of professional training, then the culture should be made to bear directly on the training, and not remain a mere survival of an educational condition that is only known to us in history. New professions are arising around, but for these our old Universities make no provisions; and old professions have completely changed their aspects, yet the

schools and colleges remain as of old. Perhaps the most robust men of our time have been our engineers and mechanicians, for they have given more impulse to civilisation than any other class of men. But I look in vain for a single representative man among our Telfords, Watts, Stephensons, Arkwrights, Wedgwoods, whose intellect was nurtured on ancient classical learning, or who could find anything in school life to aid the development of their genius. I look in vain among our scientific heroes—among our Newtons, Daltons, Youngs, Davys, Brewsters, Faradays—for one who owed the cultivation of his intellect to classical education, or who did not push aside the school learning afforded to him as a heavy weight on his mental development. I turn to our medical discoverers, who were obliged to take a classical education, and how difficult do we find it to select one with even a respectable knowledge of classics. Harvey was a B.A.; but, among our Jenners, Hunters, Cullens, and Bells, I do not remember another instance. And yet, in the opinion of many, the old classical system is that which is best fitted for mental culture, under all conditions. That it is so for the culture of statesmen is most probable, for they have to deal with men, rather than with things. That it is the most suitable for priests or for lawyers, I would admit with a great deal more reserve. I know that Scotch lawyers do not care to take our degree of M.A., and ask us to make another degree more suitable to them; but I am glad to say that our Scotch theologians now commonly graduate in arts. The fact is, that all professions have reached a stage when a single curriculum for an arts degree is neither possible nor tolerable for them, if Universities intend to maintain their chief function of liberalising the professions. You must not judge of other Universities by Oxford and Cambridge, for they are exceptional. The old English Universities have not the same function as the Scotch and Irish Universities. The former teach men how to spend a thousand a year, while the latter aim at showing men how to make a thousand a year. The first two attract the rich, and can only secure the poor by paying for their attendance; for it is a remarkable fact, according to Mr. Mark Pattison, that one out of every three students at Oxford is paid, by means of a scholarship, to attend its instructional classes. But even our popular Universities, which still give prominence to professional degrees, have a poor outcome of graduates in arts. Let us compare them in proportion to the students in annual attendance, and this will be at once apparent. In the Irish Universities there is one

degree in arts to every six students; but in Scotland there is only one to thirty students, and in the London University there is one to twenty-four. This is, no doubt, owing to the circumstance that the Scotch Universities exaggerated as much in one direction their teaching functions, as the English Universities exaggerated in another direction their examining functions. But it is due also to the fact that the revival of the practice of taking degrees in arts by examination, which arose in the English Universities at the beginning of this century, only commenced in the Scotch Universities thirty years later; and still more to the circumstance that the latter were at an early period, and are now, so largely occupied with professional teaching. In a true academic system, teaching and examining functions should be held in an even balance. But this also shows that, in the struggle for professional existence, there is little time to go aside for a degree in the faculty of arts according to its present curriculum. Professional training begins at seventeen or eighteen years of age, before an arts degree is attainable. Though society refuse to adapt itself to the ancient liberal curriculum of a University, is it unreasonable to expect that the latter should adapt itself to society? or, in other words, instead of the liberal curriculum being a mere survival of a preparation for professions which have advanced with science and left it behind, might they not go on *pari passu?* Universities cannot accomplish this by simply heaping up new subjects on an overloaded curriculum; for, in this way, study in arts and the requirements of an active profession, ever developing by discoveries in science, can never be made compatible. The curriculum must not be uniform for all professions, but be made to adjust itself to their several requirements. Universities can no longer stand on their ancient dignity, and refuse even to consider such adjustments. The demand, as I have expressed it, is not one of a few half-educated radical reformers. It is the demand of a changed civilisation, which has resulted from three main causes. These are, the rapid advance of science and its numerous applications to industrial life; the free and constant intercommunication of peoples; and the liberalisation of political institutions. It is true that these causes have been long in operation on nations, but they have produced a singularly accelerated effect in the last half-century. The youth of our country cannot chain itself to the past, and see the modern stream of thought and action flow swiftly past them. Unless our Universities go with the stream, by fitting themselves to the changed requirements of modern society, need

they be astonished if society soon get accustomed to look upon them as venerable monuments of a past age ?

You cannot suppose that I could stand before my fellow graduates, who have honoured me by election as their representative for two ancient Universities, and advocate the study of professions shorn of their liberal culture. On the contrary, it is because I feel that liberal culture is not only necessary to adorn, but ought to be the foundation of, all professions, that I advocate the necessity of bringing the Universities and the professions into a harmony which once existed, but is now replaced by discord. My object is to see Universities assume their old function of being the great liberalising power of the professions. Every profession is now vastly more extended in its knowledge and requirements than it was when Universities were first founded; yet life is little longer than it was among our ancestors. The skull of a man is a close and rigid cavity, which can only hold an average quantity of brains; it is not a vulcanised Indian-rubber bag, capable of swelling out at each pressure applied to it. We must put into this space of fixed dimensions a continually growing quantity of knowledge; and you cannot be astonished if you find a disposition to reject that which is useless for that which is useful. Liberal culture is not only useful but indispensable; only the same kind of crop is not suited for food under all conditions. If our professions reconcile themselves to our faculties of arts, the latter must first adjust a variable curriculum to the wants of the former. In the active competition of the world, men cannot afford to spend their life up to twenty-one or twenty-two years of age, in the study of a preparatory degree which is to be the mere foundation-stone of their professional edifice. The difficulty might be met by making the M.A. degree a real step only attainable by a high educational standard; while the lower degree of bachelor—the *bas chevalier* or inferior knight—ought to be reached not by one road only, but by various converging roads, suitable to the varying kinds of knowledge required by different professions. They might thus be induced now, as in past times, to resort to the faculty of arts for its seal of liberal culture. Just look at the struggles of the doctors, the lawyers, and the clergy, to get, in all sorts of strange fashions, the suitable culture which the Universities deny them, except under conditions that are inconsistent with their professional life. The clergy in England become "literates" in institutions which are cheaper and more accessible than the Universities. Medical men have to undergo a preliminary

literary examination before commencing their professional studies; and lawyers are constituting new standards of study at their Inns, or requiring them before admitting men on the roll of attorneys or solicitors. The divorce between the professions and the older Universities will soon be complete; and the gap is widening between them and the arts faculties of the Scotch and Irish Universities. Why do the Universities not study the nature of the culture expressed by these preliminary literary examinations, and offer the degree of B.A. to those who pass them with a thorough and satisfactory knowledge? That lower degree may not include everything, but it may include much. If the medical profession insist upon having a modern language, or English literature—something of Latin, and more or perhaps all of Greek, may have to yield to the new requirement. The preliminary examination for medical students, in the Scotch Universities, includes five compulsory subjects, viz.—English, Latin, Arithmetic, lower Mathematics, and Mechanics; but the M.B. must take two, and the M.D. three, of the following optional subjects, viz.—French, German, Greek, higher Mathematics, Natural Philosophy, Logic, Moral Philosophy. Surely this range of subjects is wide enough for a lower degree in arts. High literary culture is not confined to the glorious classical relics of ancient Rome and Athens. In Italy of a later period you have Dante, Petrarch, and Tasso; in Germany you have Schiller and Goethe; in France, Corneille and Racine; in England, Shakspeare and Milton. Surely a University must be hard to satisfy, if it cannot extract the graces of polite literature from such authors. The inductive, deductive, and perceptive faculties of professional men might assuredly be developed and strengthened by mental and physical science, without necessarily going back to the days of Plato and Aristotle. Such sciences might serve them better in the struggle of professional existence than the Satires of Juvenal, the Odes of Horace, or the Republic of Plato. New co-ordinations of knowledge, certified by a literary degree, would win back the professions to an organised curriculum of a liberal culture compatible with the active callings in life represented in modern society. In thus recommending an opening up of various roads converging on the minor degree of B.A., I am an advocate for liberal culture, which is now becoming, so far as our Universities are concerned, more and more rare among professional men.

Although I have more hope that the Scotch and Irish Universities

will sooner adapt their liberal culture to the professions than the old English Universities, still there are many signs that Oxford and Cambridge are alive to the necessity of specialising the studies for degrees, and of not confining them to a single curriculum. This tendency is apparent in the various schools from which honours may be obtained. The pass examination for B.A. in the English Universities satisfies seventy per cent of its students, and yet has no more intellectual significance than the title of Esquire has a distinct social value. Under altered circumstances, as a preparation for professional life, it might not mean, as it certainly does not now mean, a thorough grounding in the seven arts, but it might denote a thoroughness in preparation for those limited subjects of liberal culture which lie at the basis of each profession. If Oxford and Cambridge made its M.A. an honour degree, open only to scholarly attainments, and its B.A. a lower degree indicating efficient preparation for professional study, or even for manufacturing industry, they would not only bring themselves into better harmony with the professions, but would also improve their relations with the secondary schools, which now scarcely send a fifth of their whole number for University training. These, under the pressure of parents, are now rapidly introducing modern subjects into their schemes of instruction.

The monopolists of our faculties of arts may characterise such proposals as revolutionary; but the public, in whose interests they are conceived, know that they are only divisions of mental labour, rendered inevitable by the progress of society. Revolution is an ugly word, but it applies to education as well as to politics. The educational system of Plato has now no existence, and is only interesting in history. The old methods of teaching through dialectics answered well for centuries, but are now as extinct as mammoths. Afterwards the scholastic system did the world good service, and then wore itself out. Well, perhaps our exclusive system of classical education has had its day, and must be content to see new educational co-ordinations, in which it may sometimes have to assume a subordinate position. The wisest of books tells us that, though we should stand upon the ancient way, we should look about us and discover what is the straight and right way, and so walk in it. I have shown you that the ancient way in education was for Universities to make their arts curriculum a careful propædeutik, or course of mental preparation for the professions; and the straight and right way is for them to adjust it to the

professions as they are in modern times, and not as they were in ancient times.

As the professions found University training unfit as a propædeutik, they began to create special schools—schools of medicine, engineering, architecture, navigation—altogether outside the Universities. Sometimes these technical schools, as at Zurich and Paris, have altogether dwarfed the University systems. I am not likely to be thought an enemy to technical education, for I have long directed attention to the deficiencies of technological instruction in this country. But I have, at the same time, been chary in recommending the establishment of special schools, unless strong grounds exist, as illustrated in the Indian College for Civil Engineeering, and in the School for Navigation at Greenwich, for giving to them a character of practical training such as the Universities are not at present prepared to afford. Such special schools may produce length, but they cannot produce breadth, in education; for they look only to one subject and its applications. They focus the light, as it were, on a particular spot, and illumine that brightly, but they thus intensify the darkness all around. Unluckily the Universities allowed profession after profession to slip away from them, because they could not escape from their mediæval traditions. Nothing is more strange, for instance, than their abandonment of the teaching profession, which was of their own creation, while the older professions were rather the creators of the Universities. Originally graduates were not only empowered, but they were compelled, to be teachers. The graduation was the diploma of a teacher; yet the Universities have allowed independent normal schools for the training of teachers to grow up around them. The Education Act, especially that for Scotland, obviously contemplates that the Universities will resume their ancient functions of training teachers, for it agrees to accept a University degree as equivalent to a special examination for all subjects covered by it. A little adaptation of the arts degree would, in fact, include everything which the State demands from the teachers of a public school, except practice in teaching and in music. If, then, the Universities choose to adapt their lower degrees to the vocation of the elementary teacher, and to make a higher pedagogic degree, they may soon place themselves in harmony with that profession which originally was of their own creation. I look with confidence to the time when the State will use Universities instead of Normal Schools, as means of producing

public teachers, and when special degrees for teachers will induce men, who enter into the teaching profession, to assume that occupation with those sureties of qualifications which are now given by other recognised professions in which the public have an interest.

I have always lived in the hope of seeing our Universities resume their old function of liberalising the professions. It has, therefore, been a source of pride and gratification to me to see my own University of Edinburgh developing courses of engineering and agriculture, and opening its degrees to technological professions. It is only by thus developing professional instruction in connection with general culture that you can hope to remedy the exclusiveness and narrowness with which all professions are apt to be surrounded. Suppose, for instance, that there were as distinct colleges for painting and sculpture as there are for medicine, how soon would the study of nature, in its wonderful varieties, be cramped and crippled by the conventionalism of the professors! Schools of drawing and modelling are of course necessary, but a college of these subjects would be detrimental to the fine arts. Hence it is wise to connect fine-arts professorships with the Universities, because the artist depends for the grace of his creations, far more on his cultured perceptions, than on any manipulative dexterity of his brush or chisel.

In medicine, special schools have grown numerous, because Oxford and Cambridge neglected their duties as liberalisers and cultivators of professions. Though rivers will not flow back to the sources from whence they came, yet, in the future, the sources may supply healthier waters to the streams than they have done in past times. So our English Universities, though they have lost their hold on the medical profession, may at least adjust a preparatory curriculum to suit it, and thus secure to medical students a liberal culture bearing on their future life before they begin their purely professional training.

Universities should understand that, if they desire society to uphold their ancient academic rights, they must show themselves willing to extend modern obligations to society.

I do not presume to give detailed schemes for the construction of the various academic roads which might lead through the faculty of arts to the professional faculties. For each of these would be the best adviser how the several roads should be con-

structed. All I venture to press is, that the roads should be sufficiently numerous not only to lead to recognised academic professions, but also to the great occupations of manufacturing and mercantile industries, which above all require to be mellowed by liberal culture.

As I have now the honour of addressing an audience chiefly composed of the medical profession, allow me to explain the attitude of hesitation, if not of opposition, which the Scotch Universities have taken up in reference to a general and popular cry for a "one-portal" system of examination. This demand has arisen from a just discontent with the laxity of examination on the part of some of the nineteen licensing bodies in the United Kingdom. It is contended that a single State examination would give better security for the qualifications of medical men than the separate licensing systems. No one can dispute the right of the State to fix its own standard of qualifications for licences involving civil rights and affecting the health of its citizens. That right, as I have shown, was exercised as early as the thirteenth century, and it now receives full expression in the *Staats Examen* of Germany. But that, both in its former and present state, is a very different thing from the one-portal system which has been proposed for this country. In Germany the State examination was always supplementary to the academic curriculum. It was simply a state door, through which the University trained student had to pass before he assumed civil rights of practice. But the one-portal system proposed for this country might be anterior to University or Corporate Graduation, so that the State licence would be, instead of a supplement, a substitute for academic graduation. Any single licensing system must aim at a minimum and not at a maximum standard of qualifications. Suppose it aimed at a maximum, like the University of London, what would follow? Necessarily the ranks of the profession must remain empty. For London University, with its maximum standard, can secure annually only some thirty-five medical graduates from the whole of the kingdom and the colonies; while the medical register annually requires 700 additions. Under such a system the demand for medical men could not be supplied, and the public would suffer. Hence, clearly, the one-portal system can only prevent a man from passing in under a minimum standard, but it cannot insure higher qualifications. Yet such a minimum plan of licensing would

govern the whole medical schools of the country, as surely as the main motive wheel in a factory governs the motions of a thousand bobbins.

Under such circumstances, the ornamental degrees of Universities and Corporations would have no more influence on medical education, as a whole, than the brightly polished brass-work on the standard of an engine has upon its motive power. The qualifications of medical men would then be exactly what the minimum involved, and, except rarely, would be no higher. For all experience teaches us that the great bulk of students, with a compulsory examination before them, concentrate their vision on that alone, and refuse to look beyond it. So that teaching-schools and Universities must then teach down to this minimum, and not teach up to their maximum, if they are to preserve their students from mere crammers. It is this that has rendered uniform standards of examination so fatal to intellectual development in every country where they have been tried. It is this that has made Germany abandon its old centralised system of State examination; for it is now carried on at the seat of each University, chiefly by the professors and partly by assessors appointed by the State. Even in this modified form it has much injured medical graduation, because students work for the essential licence and neglect the mere academic honours. Germany is the typical country of Universities, for it counts twenty-four of them, and these contain 20,000 matriculated students. But its principle is to give to each University a separate autonomy and the utmost liberty of teaching and examination. It preserves for the State a right of proof that these functions have been discharged efficiently when civil rights are conferred; but it carefully makes the exercise of this right a mere supplement to a well-ordered University curriculum.* This is well illustrated in the

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* In a letter to me, dated 8th February 1873, Baron Liebig, President of the Bavarian Academy of Sciences, thus describes the action of the German system:—"We require that the physician, before he practises, should prove his capability and knowledge. The same is required from the theologian if he become a priest, as well as from the lawyer. All candidates must submit to two kinds of tests—the University and likewise the State examination. In the first all the examiners are professors. The State Commission requires, first of all, that the candidate shall present the evidence that he has passed the University examination, which gives certificates or degrees of three grades. Then the State supplements the knowledge thus evidenced by requiring its officials (doctors, lawyers, and ministers) to show further

Bills now before the Prussian Parliament in respect to theological studies. The State proposes to ensure that every clergyman shall possess liberal culture, and with this view, whether Protestant or Catholic, he must go through a curriculum of classics, literature, philosophy, and natural science in the Universities, and not merely in special seminaries. The examination in these subjects is to be in the hands of the State and not in those of the Bishops. The curriculum of study belongs to the University, the evidence of its fruition to the State. Such paternal functions of the State, even though chiefly exercised through University Professors, are rather incomprehensible to us. Doubt is expressed in Germany itself as to whether it is wise for the State to secure its ends by examination; for Professor Planck, in his recent rectorial address at Munich, counsels the State to take other means for obtaining good professional men "than its narrow and doubtful" examining systems. While no country in the world has benefited so much as Germany by its University system, none, except China, has suffered so much as France by giving a preponderance to examination, and subordinating to that the teaching functions of Universities. I have shown fully elsewhere* how France now admits that the poverty of intellect displayed during her recent crisis was the consequence of her having sacrificed the national intellect to a uniform State-examining system.

It is not easy, in the short time at my disposal, to show you how Germany has managed to reconcile free University teaching with a State-examining system, without injurious consequences to intellectual development, but this has been well done by Matthew Arnold.

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qualifications which entirely relate to *practical* subjects. At this examination University Professors are associated with other examiners. We would, in fact, think an examining board without University Professors defective. It is true that we do not think every medical man should be an M.D. The State licenses him to practise after he has passed the University test. The M.D. is now looked on as a University honour, only imposed as a necessity on men who intend to follow an academic career. You will understand from this that the State examination does not affect the independence of our Universities, because the University examination precedes the State examination. It is the University that determines the *scientific* qualifications of the candidate, and what practical tests the State cares to apply to its officials do not concern us."

* "Teaching Universities and Examining Boards:" Edmonston and Douglas, Edinburgh, 1872.

Certainly German ideas of examination are as opposite to those which prevail in our Universities as they can well be. With us examination is the end of University life, while in Germany it is the mere test of a well-ordered course of study. All "*specielle vor-studien*" are expressly discouraged, and the examination aims at the proof that the student has attained "*das Wesentliche und Dauernde*," or a substantial and enduring result of study. Under our examining systems cram flourishes; in Germany it has little existence, for the examination, which is a subordinate function of their University system, aims at the proof of intellectual development fitted for a future career of usefulness.

Let us apply these national experiences to the satisfaction of a reasonable demand that the medical practitioners in this country should at least possess a minimum standard of efficiency. While the State has a right to demand that, it is clearly its interest and policy to effect its purpose in such a way as will insure maximum and not minimum qualifications. It is not wise to have either uniformity in teaching or in examination; for differentiation is as important in intellectual as it is in physical life. But a one-portal system is based on uniformity, and it would effect it as surely on the student, as the single hole of the wire-drawer does upon the wire drawn through it. To avoid this, we now find the one-portal system abandoned for a three-portal system, one door of entrance being proposed for each section of the United Kingdom. No doubt this is better, for it would secure at least national differentiation, though it would still cramp professional development in each section of the country. The only justification for the interference of the State is the assumed position, that the nineteen licensing bodies, by their competition, have a tendency to lower qualifications. I doubt this as a fact, but I have no doubt whatever that a downward competition would be the inevitable result of a single examining board. Though the Corporations, under conjoint schemes of examination, continue to give the license in name, they will be virtually superseded in testing the fitness of candidates to receive the titles which they confer. It does not require a sage political forecast to know that such a conjoint system possesses neither the condition of permanence nor of strength. Coherence it cannot have, for the public would soon doubt the wisdom of continuing corporate powers when they are exercised in name and not in reality; and, as soon as the danger becomes patent, the Corporations will dissolve a voluntary union which saps their existence. Unless

they wake quickly to a sense of their danger, the system may be rivetted by legislative action. The Corporations are not teaching, but licensing and examining bodies; and when they resign these powers to a conjoint body of examiners, it becomes very difficult to understand why provincial candidates, at least, should care to belong to them, or why the public should prolong their existence. I should regret their extinction, because I value them as productive of professional strength and of *esprit de corps*. It is by such unions that the medical profession possesses political power and influence. The effect of their absence may be seen in such incoherent professions as the Merchant Navy, which contains men of high qualifications, but possessing small power, from want of bonds of union such as the Medical Corporations afford. The only bodies which are likely to be long survivors of a conjoint examining system are the Universities, for they have specific teaching functions, which would still remain after the Corporations have been swallowed by the ogre of conjoint examinations. Should the State, under the influence of the popular cry, assume the function of examination, it would be productive of the least evil, if it limited that to strictly clinical subjects. The teaching bodies would then occupy themselves with laying down a sound scientific and systematic basis of professional knowledge; while the State would gain assurance that the practitioner could apply his science to the actual practice of his profession. A second contingency is possible, for present State interference may be the future forerunner of free trade in medicine; because, when the Corporations succumb to the feeling of their inutility, and the State becomes disappointed with the result of a minimum examination, medical men as individuals may have to submit to whatever relations the State cares to establish with them. When legal recognition is asked by medical men from the State, it has a right to fix their qualifications in the interest of the public. That right follows legal recognition and the bestowal of civil rights, but the State is not bound to repress irregular practitioners who demand no recognition; and the time may come, when the profession has yielded itself to the influences of the State, that the latter may look upon regular and irregular practitioners as outside its functions altogether. In other regions of politics, as for instance, in regard to religion, there is a tendency for the State to cut itself adrift from complications of this sort. Under the present system the medical profession is in no danger, for it regulates its own affairs, and has little connection with the State. The less it has to do with it the

better, if the dignity and independence of the profession be consulted. The Medical Council is not supported by imperial taxation, but by professional contributions. Though it is not constituted with that popular representation which ought to be the basis of such an assembly, it is in theory and in fact a representative body. Into this the State also sends members of the profession, always men of a representative character; and as long as it continues to do so, its right is not likely to be questioned, though it is doubtful in principle. The Medical Council needs reform, but this may be effected without subverting the teaching and examining functions of Universities and Corporations. I am sure, when the medical profession realises the disastrous effects which uniform examining systems have produced in other countries on national intellectual development, that it will be slow to introduce them into this kingdom, or to relinquish the independence of the profession for the doubtful advantages of direct State recognition. No doubt the Medical Council ought to take ample securities, either by efficient inspection or by participation in examinations, that every separate examining board never descends below a minimum standard of qualifications; but, in doing this, so far from seeking uniformity in examinations, they should encourage variety, and should welcome all aims at higher qualifications on the part of the examining bodies, stimulated to differentiation by whatever methods or subjects their teaching staffs choose to introduce. It would of course be possible in a central examining system to have degrees of qualifications, but such a plan would assuredly destroy variety in teaching, still more effectually than a minimum test, because it would suppress University degrees and Corporation honours, and substitute State uniformity in honours and in the means of attaining them.

After what I have said, you will see how impossible it is for me, as representing two Scotch Universities, to yield to a popular cry of a one-portal system. It is a matter of indifference to Oxford, Cambridge, and the London University, whether they accept or refuse such a system. Their medical degrees, taken altogether, do not equal one of the Universities which I have the honour to represent. The teaching functions of the English Universities, as regard the professions, have little more than a nominal existence. The Scotch Universities, both as to teaching and graduation, are in most intimate connection with the people of Scotland, and derive their whole strength from them. You recollect that even Hercules

was not a match for the Libyan giant Antæus, as long as he was in contact with his mother earth, whence all his strength was derived; but when Hercules lifted the giant from the earth he lost his power, and was easily squeezed to death. The Scotch Universities feel that a conjoint scheme of examination would part them from the people, and turn their strength into weakness. In Scotland there is one University student to 860 of the population; but in England there is only one to 4020. The Scotch professional students are not unfrequently poor, yet they struggle to obtain a high education through their Universities; for these are little more costly to them than the extra-academical schools. But, if you raise a conjoint examining scheme, to provide a minimum qualification, leaving to the Universities the mere ornamental position of offering a more extended curriculum and higher qualifications, you expose the poor students to an irresistible temptation to be satisfied with the minimum, and to neglect the maximum. Academical teaching and honours in Scotland would then pass from the poor to the rich, as they have done in England, and the Scotch Universities would be severed from the people, the sole source of their strength. With the remembrance of what happened to Antæus of old, are you surprised that they cling with all their force to the people, and decline to be severed from them, lest they receive the embrace of death from some Hercules in the guise of a medical officer of the Privy Council or Local Government Board? The Scotch Universities will cordially welcome any system of thorough inspection of their examinations, on the part of the Medical Council, or they will willingly receive accessory examiners, who may be appointed by the Council; but they resolutely oppose a concentration of examinations, which all experience has shown to be most detrimental to higher intellectual culture.

I have now finished, and I trust I have convinced you that it is not only possible, but easy, to put our Universities into harmony with active professional training. To do so is only to bring them back to their original purpose of liberalising the professions. But liberal culture must have a wider meaning than it has now, if this harmony be re-established. Each profession has its own foundation of liberal culture. At present the Universities try to build all professions on one uniform foundation, though this is as foolish as it would be to build a palace, a gaol, or an infirmary, on a single ground-plan common to all. The professions have indicated, by

their special literary examinations, what their several foundations should be; and if the Universities know how to extend their obligations to modern society, they should have little difficulty in again assuming their original purpose of affording a liberal culture to the professions. The Universities would thus gain in strength, and the professions in dignity and in efficiency.

ON PERFORATION OF THE INTESTINE,

WITH THE HISTORY OF TWO CASES WHICH OCCURRED IN THE COURSE OF PYTHOGENIC FEVER.

By Henry Moon, M.D., F.R.C.P. Lond., Physician to the Sussex County Hospital.

The digestive and intestinal tract, from the pharynx to the anus, is liable to a variety of diseases, sometimes leading to the perforation of its walls, and ending in death: such as cancers, gelatiniform softening (giving rise to spontaneous perforation), perforating ulcer of the stomach, enteritis, ulcerative inflammation of the follicles of the colon, An impacted renal calculus in the ureter has given rise to abscess, sometimes opening into the cœcum, as well as externally; the vermiform appendix may afford lodgment, in its cavity, to indurated pellets, fæcal matter, cherry stones, shot, and other bodies, which cause irritation, inflammation, thickening of its coats and ulceration, catarrhal inflammation in the cœcum; and Rokitansky directs attention to a particular form which he terms *Typhlitis stercoralis*, indicating thereby its production by accumulation of indigestible and fæcal matters in this situation. Removal of the accumulated pus, and avoidance of fresh accumulations, generally suffice to establish a cure: otherwise, ulcerative destruction of the mucous membrane, and continued sinuous suppuration of the muscular covering, result. In this manner rapid perforation of the intestinal parietes, especially of the posterior side (where it is sparingly covered with peritoneum) may follow; either inducing extensive inflammation, destruction of the cellular tissue in the iliac or lumbar regions, and death, or giving rise to general peritonitis from transmission of the general inflammation to the serous membrane.

Inflammation sometimes attacks the loose cellular tissue which lies between the peritoneal surface of the cœcum and the iliac

fascia, and is apt to pass into suppuration; in many instances it is doubtless set up by pre-existing, perhaps chronic, inflammatory disease of the bowels; when catarrhal inflammation of the cœcum exists in a chronic form it has sometimes caused condensation of the surrounding cellular tissue, and shrivelling of the intestine itself, so that it is found converted into a slate-coloured capsule, with dense parietes, not larger than a walnut or pigeon's egg. The intestine may be perforated by tubercular ulceration, by violence, by penetrating wounds, or as the result of pythogenic fever.

All of these well-recognised conditions are full of interest, and more than sufficient, separately, to occupy the space allotted for a paper; I therefore purpose to confine myself to those instances of perforation of the bowel connected with pythogenic or enteric fever—the typhoid process, as it has been called.

It will be scarcely necessary here to speak very fully of the peculiar characteristics of pythogenic fever, but merely to say, the disease is generated spontaneously by the decomposition of fæcal matter, or by drinking water contaminated with sewage; it is most common during the autumn and early winter months. The attack may occur immediately on exposure to the poison, when the latter is concentrated (as I have several times witnessed), beginning with vomiting and purging, so as to give rise to the suspicion of poisoning by one of the irritants or narcotico-irritants; in most instances, however, there is a period of incubation of from ten to fourteen days. The disease may extend itself by the infected passing into healthy localities; but it is much less contagious than typhus or relapsing fever. The infantile remittent fever of England is merely pythogenic fever modified by the tender age of the sufferer.

It has been proved that fever arising from sewer emanations is always pythogenic fever, and never typhus or relapsing fever, and this fact explains why pythogenic fever is endemic in many places, and epidemic in circumscribed localities; why it attacks the rich as well as the poor; why it occurs in isolated country houses as well as in large towns; and why it is most prevalent in autumn and in warm seasons. Hence the paramount value of efficient drainage to our dwelling houses.

For several years typhus and pythogenic fevers were regarded as varieties, but not distinct species; the admirable researches, however, of Dr., now Sir William Jenner, published between 1849 and

1851, have amplified and confirmed the distinction between the symptoms of the two diseases (previously drawn, however, by Gerard, Stewart, and others). By an analysis of all the cases admitted into the London Fever Hospital for more than two years, he showed that the two fevers did not prevail together, and that the one did not communicate the other; he also adduced cases to prove that an attack of one fever protected from subsequent attacks of itself, but not of the other. He maintained that typhus and enteric fever were as distinct as any two of the exanthemata; subsequently physicians and others enjoying independent spheres of observation have arrived at the same conclusion, as Peacock, Wilks, Watson, Tweedie, Gairdner, Anderson, Lyons (of Dublin), Murchison, &c.

The advent of pythogenic fever (from a digest of seventy cases admitted into the Sussex County Hospital, under my care, since August, 1861,) is for the most part gradual; the early symptoms are irregular chills, languor, loss of appetite, pains in the head and limbs, giddiness, noises in the ears, with abdominal pains (with or without sickness), diarrhœa (in six cases, however, diarrhœa has been entirely absent after admission, in two of them it had been present before admission but did not return), quick pulse, hot skin, tongue furred, red at the margins, restless nights, the fever greatest towards evening and in the night. I have known several patients walk to the hospital in the second week of the fever.

The temperature rises very gradually, during the first week, from 98 to 103 degs. Fahr.; that in the evening is often two degrees higher than in the morning; but at the end of this first week there is no great increase of evening temperature.

In the second week there is only a slight morning remission. Bowels continue loose; stools four, five, or six in twenty-four hours (they have been compared often to yellow ochre or pea-soup), always alkaline. Pulse, from 100 to 120—quicker toward evening—very empty and pressible. The abdomen more tympanitic, and there is often gurgling, on pressure, in the right iliac region.

An eruption, between the seventh and twelfth day, usually appears on the chest, back, and abdomen, (in ten out of the seventy cases I could, however, never find these rose maculæ); fresh spots appear, old ones fade (never converted into petechiæ); the spleen enlarges; headache, giddiness, and disturbed sleep continue, with scanty high-coloured urine. The mind is usually clear, and the

countenance differs much from the dull, heavy, stupid expression of typhus or of pneumonia. About the end of the second week the headache and general pains abate, very frequently to be succeeded by more or less somnolence, often interrupted by delirium, especially at night. The lips become dry, with sordes. The tongue red, glazed, and fissured. Abdomen more distended; bowels running off; stools contain membranous flakes, and sometimes blood in larger or smaller quantities.

In the beginning of the third week there is often an increase of temperature, and, if improvement takes place, the difference between morning and evening is very striking, say from 98 to 101 degs. Fahr., or from 100 to 104. The diminution of temperature in recoveries will be gradual, not sudden, as in typhus. The mild cases have generally ended in twenty-one days; but severe ones have run on to four, five, or even eight or ten weeks.

The most unfavourable symptoms are hæmorrhage, persistent diarrhœa, a very frequent pulse, great heat of skin (especially if the morning temperature exceeds that of the night), continuous delirium, muscular twitchings (and they often forbode a fatal termination), between the twentieth and thirtieth day.

Simultaneously with these outward symptoms, internal pathological changes are taking place, especially the specific lesions which are invariably present, and which consist of a peculiar disease in the agminated or of the solitary glands of the ileum. The first stage, that of enlargement from a deposition of morbid material in and about the agminated and solitary glands, commences perhaps on the second day of the fever, according to Bretonneau, Forget, and Bristowe, who have recorded instances on the sixth, fifth, and second days. Rokitansky says there is a condition of local hyperæmia which precedes it, and Trousseau thinks it does not occur until the fifth day. The second stage, or that of ulceration, begins, as a rule, about the ninth or tenth day. Louis, Chomel, and Forget, record cases where death occurred on the eighth day, but in none had ulceration commenced; but in Forget's cases the agminated glands are described as at the point of ulcerating. There are many instances on record where ulceration was found on the ninth day.

The matter deposited in the intestinal glands does not of necessity lead to ulceration; there are good reasons for believing that it is occasionally re-absorbed. According to Trousseau, resolution independently of ulceration, may commence about the tenth day,

and by the end of the third week it may be complete. This may account for those mild cases of enteric fever of short duration.

But ulceration of the diseased Peyer's patches usually takes place now, *i. e.*, the end of the third week, constituting the typhoid "ulcer," as it is called. The whole of a diseased patch may slough out at once, or it may slough in successive portions, the size of ulcer varying from a hemp seed to half-a-crown, and the shape elliptical, round, or regular and sinuous, according to the part which has been affected. The margin of the ulcer is usually formed by a well-defined fringe of mucous membrane, best seen when the bowel is floated in water. The base of the ulcer is formed of a delicate layer of submucous tissue which covers the muscular coat. The lower third of the small intestine is the seat of the ulcerative process: the number and size of the ulcers increase as they advance toward the ileo-cœcal valve, although I have sometimes seen the mucous membrane of the large intestine riddled with ulcers, many of them of large size. The bottom of the ulcer, as I have said before, is commonly formed by the submucous tissue; sometimes the muscular fibres are completely exposed, and occasionally the peritoneum. This is, however, generally the result of secondary advance, subsequently to the expulsion of the typhoid deposit.

Rokitansky and other observers have particularly insisted on the point that, when an ulcer increases in depth, so as to perforate the intestine, it advances, not by continued deposition and softening of typhoid matter, but by simple extension of the ulcerating action.

The third stage is that which intervenes between the separation of the morbid deposit and the commencement of cicatrization.

Fourth stage. Cicatrization begins about the end of the third week, and lasts probably about a fortnight; but when ulcers pass into a chronic state, and at the end of the fourth week are not undergoing cicatrization, these chronic ulcers may cause severe diarrhœa, and may lead to perforation.

It is, however, with ulcers perforating the ileum, with the escape of the intestinal contents into the peritoneum, I have now to do. It occurs in the course of no other acute disease; the only other affection which gives rise to perforation in this part of the bowel, is tubercular ulceration.

Case I.—Selina Tupper, æt. nineteen, housemaid, was admitted into FF. Ward, under my care, in the Sussex County Hospital, July 24th, 1866, having been ill since her rigor. Her bowels had been

very loose, and for two days before admission she had been delirious at night. Pulse 120, full, but pressible. Milk, beef tea. Liq. Belæ two drachms every four hours.

August 1, the fourteenth day of the fever, she was extremely weak, with a pulse of 140 ; tongue red at tip and edges ; delirious and restless at night ; thirst. The mind confused, but she understands what is said to her. Lenticular spots on the skin of the chest, abdomen, and back. Tympanitis ; gurgling on pressure over the cœcum ; abdomen tender and painful. Bowels running off frequently ; stools of the consistence and colour of pea-soup ; much exhausted by frequent stools. In addition to milk and beef tea, brandy six ounces, a linseed meal poultice to abdomen, two grains of acetate of lead, with half a grain of extract of opium every four hours.

August 4th, eighteenth day of fever.—Two loose stools in twenty-four hours only. Abdomen less tender, painful, and tympanitic. Pulse 130. Takes milk and beef tea freely. Sleeps at night. Crops of lenticular spots re-appearing.

August 16th, thirtieth day of the fever.—Convalescing. Bowels quiet. She is cheerful. Substitute eight ounces of wine for the brandy, light pudding, milk and beef tea, with an egg.

℞ Acidi Hydrochl. Dil., ♏ xv.
Quiniæ, gr. ss.
Aquæ Carui, ʒj. M.
Every four hours.

August 19th, thirty-third day.—Convalescing. A little fish every second day.

August 24th.—In the afternoon of the thirty-eighth day she vomited, was much depressed, shivered, tongue became dry, abdomen extremely tender and tympanitic ; stools frequent, countenance pinched, extremities cold, intense thirst. Pulse 150 and 160, very feeble and small. Ice ; a tablespoonful of iced milk and beef tea, alternately, every half-hour ; twenty minims of tincture of opium, in a teaspoonful of water, every two hours ; brandy six ounces.

August 25th.—She passed a sleepless night ; her mind clear. Complained of distended abdomen. Pulse scarcely perceptible. Respiration quick and costal. Countenance much pinched, face and extremities cold, and she died, from peritonitis, twenty-four hours after the aggravation of her symptoms from perforation of the intestine, on the thirty-ninth day.

Post mortem, twenty-four hours after death.—Rigor mortis well marked. The abdomen contained much flatus, and a large amount of recently-effused lymph, occupying the surfaces of the convolutions of the intestines. The peritoneal cavity contained about half-a-pint of dirty fæcal fluid: the whole extent of the peritoneum vascular, as well as the ileum; typhoid ulcers numerous, especially in Peyer's patches, in some parts entirely sloughed out, exhibiting the muscular covering. Twelve inches above the ileo-cœcal valve there was a small perforation through the entire walls of the intestine, of an elliptical shape, scarcely visible until a portion of recently formed lymph was removed. There were numerous deep ulcers in the lower four inches of the ileum, terminating rather abruptly at the ileo-cœcal valve; mesenteric glands enlarged.

Case II.—Thomas Funnell, æt. thirty-five, bricklayer, admitted October 14th, 1868, into F. Ward, Bed 4. He comes from a house infected with pythogenic fever, and in which there were bad smells from overflowing cesspools. Fifteen days ago, after feeling giddiness, languor, loss of appetite for some days, he had shivering, succeeded by thirst, loose bowels, headache, pain and tenderness in the right iliac region. Pulse now 125, pressible. Skin hot, urine scanty and high coloured, tongue coated in the centre, and red at tip and edges; rose maculæ in abundance. Milk and beef tea; a poultice to the abdomen.

℞ Liq. Belæ, ʒ ij.
Liq. Opii Sedativi, ♏ iij.
Aquæ Distillatæ, ʒ j. M.
Every four hours.

October 19th.—Now about the nineteenth day of the fever. Abdomen less tympanitic and less painful. Two stools in twenty-four hours. Sleeps better; tongue less coated and dry. Pulse 120, compressible, but fuller. Takes nourishment freely, with six ounces of wine.

October 21st.—On the twenty-first day of the fever some grapes were smuggled into the ward by his friends, which he ate with the skins and seeds.

October 23rd, twenty-third day of the fever.—A sleepless night from great abdominal pain; tympanitis and tenderness; stools more frequent. Pulse 140, sharp, but pressible. Sordes on teeth and lips; vomiting; delirium. In the evening all these symptoms were aggravated. Shivering, coldness, and delirium; tongue more dry, thirst intense. Pulse scarcely perceptible. Extremities cold. Countenance pinched. Ice; milk and beef tea, a tablespoonful,

alternately, every half-hour. The nurse was requested to keep him absolutely free from movement, and to administer one tea spoonful of a medicine containing twenty minims of tincture of opium to one drachm of distilled water, every hour.

October 24th.—He died in the evening, with all the symptoms of peritonitis, about thirty-five hours from the aggravation of his symptoms, and three days after having eaten the grape-skins and seeds.

Post mortem, twenty-four hours after death.—Rigor mortis well marked, no decomposition of the body. Abdomen distended with flatus; the intestines covered with a quantity of recently effused lymph, which glued the convolutions of the ileum together. Mesenteric glands much enlarged. Liver, kidneys, and spleen, soft in texture, and congested, otherwise healthy. Peyer's patches: the vessels of the ileum injected, but two Peyer's patches only were the seat of disease: one about a foot and a half from the ileo-cœcal valve, of the size of a mulberry, was in a condition of sloughing ulceration, but the sloughing did not involve the peritoneal covering. The other patch, nearer to the ileo-cœcal valve, about the size of a shilling, was in a more advanced stage of sloughing ulceration, it having involved the whole thickness of the intestine, so that, when viewed from the peritoneal surface, it presented a sloughing patch about the size of a fourpenny piece; at the edge of the slough was a small opening from which fæcal matter had escaped. This opening had become occluded, by becoming glued to another coil of intestine, by a layer of lymph.

In each case the effort made by nature to cure perforation was strikingly manifest, and points out the value of absolute rest in the attempt to assist her in the process. Patients convalescing from pythogenic fever require far more care and watching than in those recovering from typhus; for while the intestinal ulcers are undergoing cicatrization, much mischief may be done by purgatives and improper food. For a month, at least, after the cessation of the primary fever, castor oil, or simple enemata, are the only means which should be resorted to for opening the bowels. I never order fish for at least a week after the commencement of convalescence, and prescribe afterwards a little chicken, or soft meat, every second day; before this time I restrict the diet to milk, eggs, beef tea, light puddings, &c. The liability to perforation and relapse, during convalescence, must always be borne in mind.

Among the complications of enteric fever, peritonitis is the most

serious one; for there are no means by which we can distinguish peritonitis from perforation of the bowel from other causes; but in the great majority of instances perforation proves to be the real cause. I need scarcely add that opium is our sheet anchor in these cases, given boldly. The object is to paralyse the bowels, so as to prevent the escape of their contents into the peritoneum, and favour the formation of adhesions. The patient should be kept in a state of absolute immobility.

Most observers, including Louis, Chomel, Rokitansky, Sir William Jenner, have expressed an opinion that perforation is invariably fatal, and certainly the instances are few where it is not so. Dr. Tweedie says he has witnessed the recovery of two; the late Dr. Todd, of one; Dr. Fox, of one; Dr. Bell, of Glasgow, of several; Dr. Murchison, of one. It may fairly be doubted if the peritonitis, in *all* these cases of recovery, has been due to perforation of the bowel.

Trousseau, in 1861 (p. 142), and Jenner, record cases where it was found after death to be independent of perforation, although all the symptoms of peritonitis from perforation had existed during life. Taking a pathological view of the question there appears to be no reason why recovery should not take place; for in my own two cases the perforation was small, with the edges glued to the neighbouring parts, in such a way that little or no escape of the intestinal contents had taken place, and where in fact a natural process of cure appeared to be commencing.

The diseases most apt to be confounded with enteric fever are: typhus, relapsing fever, remittent fever, scarlatina, pyæmia, latent pneumonia, acute tubercles of the lungs, tubercular meningitis, cerebral softening, gastro-enteritis, and some forms of chronic peritonitis.

Typhus.—The eruptions are the grand distinguishing mark between enteric and typhus fevers; when they are absent it may be impossible to say to which fever a case belongs, or whether it is fever at all; for if the typhoid state be developed when the patient first comes under observation (and having no previous history) it may be impossible to decide whether the case is typhus, enteric fever, cerebral disease, or disease of the kidneys.

The mere existence of diarrhœa does not distinguish enteric fever from typhus. Typhus may be complicated with diarrhœa, and the bowels may be constipated in enteric fever.

If, however, diarrhœa co-exists with tympanitis and pain in the

right iliac fossa, and if the stools, at the same time, be ochreous-yellow, it may be concluded that the case is one of enteric fever; and this opinion will be strengthened by the occurrence of bleeding from the nose, intestinal hæmorrhage, or rose maculæ on the skin of the abdomen. Then the emaciated countenance, and the circumscribed pink flush on either cheek, contrast strongly with the heavy expression, the dusky countenance, and injected conjunctivæ of typhus; the contrast of the tongue in each disease, duration of the illness, the absence of the mulberry rash, and the circumstances under which the disease appears, will, in the majority of instances, enable the practitioner to diagnose the fever as pythogenic, and not typhus.

Of seventy cases of pythogenic or enteric fever, (mortality in England and France about twenty per cent.,) thirteen had intestinal hæmorrhage; fourteen died, two from perforation of the ileum (one in every thirty-six persons dies from perforation); and pneumonia occurred in seven. Others died from asthenia, which may perhaps be ascribed to a morbid condition of the muscular tissue of the heart, to the profuse character of the diarrhœa, or to the protracted interstitial death of the tissues, resulting from the febrile process. In all the fatal cases there were ulcerations in the ileum; softening of the secretory glands, spleen, kidneys, liver, and of the lungs and heart; and often a complication such as peritonitis, pneumonia, or erysipelas.

ON THE EXERCISE OF THE WILL, AND ON THE USE OF REFLEX EXCITATION, AS MODES OF TREATING CONSTIPATION.

By R. B. Painter, M.D., F.R.C.S. (Exam.)

In the following remarks I wish to speak of that form of constipation which arises from defect of power in the nerves or muscles of the intestinal tube, or deficiency of the lubricating mucus; in consequence of the existence of one or both of which defects the motion is passed along the colon and rectum so sluggishly that habitual constipation is the result.

In some instances the patient will tell you he can often feel the motion in the rectum, but cannot expel it. On other occasions the arrest occurs higher up in the colon, and the rectum is empty. Anyhow the intestinal tube is packed with hard, dry fæces, and the longer it remains so filled the more overstretched and feeble the bowel will become. I expect in all these cases the weakness of the muscular coat and the absence of mucus depend on deficient nerve force.

Now, it is usual to treat persons affected in the manner described with enemas, galvanism, aperients, and tonics, either alone or variously combined, such as iron, aloes, strychnia, rhubarb, &c., as also mineral waters. All these modes, however, are more or less troublesome, and I question whether any of them can be used for a lengthened period without doing more or less harm. At any rate it is difficult to omit them after having once taken to their frequent and regular use. A cold-water enema is doubtless one of the best and least harmful expedients, and it was in considering its physiological action that I was led to the following ideas in the endeavour to invent some plan by which to supersede so troublesome a process.

Let us first consider natural defecation, and then what is the

action of an enema. In a healthy person, as the motion passes into the rectum a lubricating mucus is secreted, and as soon as the rectum is filled a reflex action is excited, and the bowel is emptied. An enema acts by causing a still further dilatation and excitation of the bowel than is caused by the natural motion, and hence the sluggish secretions and muscles are stimulated to increased action.

It is unnecessary here to enter on any description of the excito-motory system, or of the ganglionic nerves, they are so well understood; but it is necessary for my purpose to remark on the power of the Will, to a certain degree, over both systems. For example, the eye by an effort may be kept open while you touch the ball with the finger; or the desire for defecation may be, for a time, successfully resisted; and as to secretion, "the mouth may water" or not, as influenced greatly by the Will, at the sight or thought of luscious food. Here are proofs therefore, and many others will occur to the reader, of the power of the mind over the involuntary systems of nerves, both as to motor and secretory action.

Now, by use, this influence of the Will over the involuntary nerves may be intensified; and by frequent repetition of the voluntary action of the mind to strongly desire either to do, or not to do, the power over the secretory and motor actions will be strengthened. We know, for example, how by practice the facial muscles may be trained so as to, in a great degree, control natural expression; and how even an emotional person, by practising powerful effort of the Will, may overcome the tendency to shed tears. On the other hand, in the same way that the power and influence of the Will may be, in considerable degree, trained to exercise repression of the natural and partly voluntary nerve action, so I believe the converse power may, to some degree, be gained over the involuntary nerve systems. It is well known how some persons can squeeze out a few tears as the occasion may suit. Hence I believe it is quite possible for some persons to acquire a considerable voluntary influence over the involuntary nerves of parts we are not so much in the habit of considering as being under the influence of the Will, *e.g.*, the muscles of the rectum and its secretory apparatus.

The way is now, I hope, made clear for the consideration and description of the mode I wish to advocate for treating the kind of constipation spoken of at the commencement of this paper, the special object in view being to get the bowel to contract without

exciting it by purgatives or enemas. In the first place, it is most important that the sufferer should go to the closet always at the same hour of the day, as habit in this respect is most important, and sit down whether he feels the desire or not. He should then endeavour to fix his *entire* attention on the subject of his wish—the desire to relieve himself. I say his *entire attention*, because it is most important he should try and banish all other ideas, so as to *concentrate all his active nerve energy on what he is about.* Having so concentrated the whole of his attention and mind on this earnest wish, it is most probable, after some practice, he will find he can be more easily relieved than of yore.

If he fails, however, he should then use the following mode of exciting reflex action. Let him apply the tips of several fingers of one hand on the anus, covered by a soft piece of paper; then by sharply flexing the fingers produce, by successive contractions, a series of impulsions on the part. This excitation will probably be found, after a little practice, to set up reflex action, and the bowel will be emptied; indeed, if the rectum contains a hard motion, it will almost certainly be expelled. If, however, the palpation spoken of fails, an enema must then be used for that day; but let the above plan be again and again resorted to as often as required, and, after a little practice, I think failure will be the exception. At any rate, a golden rule must be observed, that is, never to allow any motion to remain in the rectum; for if so, and not emptied daily, its walls, from being kept constantly distended, will become dilated and weak. Indeed, when a person goes to stool, nothing should be left in the rectum, as is I expect often the case in atony of that viscus; for then another evil will come into play, which is, that if a portion of motion is left constantly in the rectum at the end of a defecation, the nerves of the part will become so accustomed to this continual presence of a foreign body, that the natural reflex action will cease to be excited, and a semi-paralysed condition be thereby added to the previous atony and dilation.

Whole-meal bread is a most important aid in softening the motions, by exciting the secretion of mucus and the action of the muscles of the intestine; nor is the influence of the phosphates in the whole-meal bread to be disregarded in their probable effect on the nervous system.

In conclusion, I think the reader who has had the patience to peruse these rather unpleasant details will consider that the treatment, however physiological it may be, is, at any rate, incapable

of general use, as it is so difficult of explanation to a patient. That may be so; but, nevertheless, I know that, in fit cases, the method I recommend is calculated to prove a constant boon. If, therefore, these ideas prove useful, even only to one of our own profession, I shall be gratified that my small labour has not been in vain. I have little doubt that a physiologist would be better able to influence his involuntary nerve system than another person, as he would more easily comprehend how he may train his Will.

ON A CASE OF RECOVERY FROM HEMIPLEGIA.

MUCH DAMAGE OF MOTOR TRACT AND CONVOLUTIONS REMAINING.

REMARKS ON CHOREA.

By J. Hughlings Jackson, M.D., F.R.C.P. Lond.,
Physician to the London Hospital.

The following case shows in a striking manner the truth of what I have long insisted on, viz: that recovery from paralysis occurs notwithstanding that the paralysing lesion or a great part of it remains. It is the most important illustration of this fact that I have yet seen. I will now try to show how it bears.

It has been an almost universal objection to an opinion I have held on the pathology of chorea, (viz: that it frequently results from embolism,) that the patients in many instances get well, and get well soon, often in a few weeks for instance. The fact I have always admitted, but I could never see that the objection was the fatal one it was assumed to be. I have made post-mortem examinations showing that recovery had occurred from *paralysis* due to *far grosser* cerebral lesions than I or anybody else ever supposed to exist in cases of chorea. It has been a matter of regret to me that the most able of those who have raised this objection have not criticised the statements I have made bearing on it. Had my arguments on this point been combatted I should doubtless have found weakness in them. I will not here repeat the evidence I have adduced, but may refer the reader to facts and inferences on the subject: *Medical Times and Gazette*,* December 21, 1867; *Medical Mirror*, September and October, 1868; and "A Study of Convulsions," vol. III of these Transactions.

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* I give however one quotation from that article.

"There is no doubt that a large part of one cerebral hemisphere may be destroyed without any permanent mental defect. It is equally certain that a part of the corpus striatum may be destroyed without any permanent hemiplegia. But no one denies that the hemisphere is the chief seat of the

I confess I do not see that the fact of the recovery of a child from chorea presents any great difficulty to the hypothesis of embolism, if the facts of such cases as that which I here relate be considered. Let the state of the corpus striatum be carefully considered. But the custom is not to study one kind of case of nervous disease by the aid of another case in great part different. To reasoning from the case of E. G. (page 64) to one of chorea, it would be objected, "*that* is a case of paralysis, not of chorea." Nevertheless, there can be no doubt that there are cases of hemi-chorea exactly like cases of that form of hemiplegia which results from disease in the corpus striatum—like them in that *the region affected* is the same (face, arm, and leg), is of course meant.

It is really far simpler to study *first* the symptoms of hemiplegia, and *next* those of chorea and convulsions. The hemiplegia is to be

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mind, and that through the corpus striatum the rest of the nervous system acts on the limbs.

"In incomplete hemiplegia—to limit the illustration to the arm—there is, not palsy of part of the arm, but partial paralysis of the arm (*vide infra*). So it seems that each movement of the arm is represented in each part of the corpus striatum, or, conversely, that each part of the corpus striatum represents the movements of the limb as a whole. In complete hemiplegia the arm cannot be moved in any way, except by swinging it from the shoulder; and in incomplete hemiplegia the fault is not so much that some one or more motions cannot be performed at all, the rest of the arm being good, but that although all the movements are to be done, they are all badly done. And when the destruction of nerve tissue is slight in extent, there need be no permanent defect in any manner of movement. Applying this principle to the brain, we may understand how it is that there may be a large abscess in one cerebral hemisphere and yet no obvious mental defect. Or to take, with arbitrariness, a special series of motor and sensory processes, we see how it happens that disease of the forepart of the anterior lobe, of the posterior lobe, and of the hemisphere above the lateral ventricle, need not produce any defect of the psychico-physical processes which constitute the phenomena of language. Just as in the arm nervous-system there is a gradually increasing complexity, from the delivery of nerves to muscles through interweaving of nerves in the nerve-trunks, to an interrelation so great in the corpus striatum, that damage to a small part of this organ weakens the whole of the limb, and yet destroys no single movement—so we may fairly infer that, continued from the corpus striatum, deeper in brain—further in mind—are still more complex arrangements of motor processes, reaching a minute degree of interrelation and a vast width of association with the complex *motives*—the sensation aspect of mind—of the hemisphere, and becoming at length so complete that a quantity of brain may be destroyed without any special mental defect resulting."

looked on as a sort of experiment, telling us what movements are represented in the corpus striatum and its region. If in another case we find activity of those very parts which are paralysed from a clot in the corpus striatum, what is the inference?

As I think my colleague, Dr. Radcliffe, has put the matter more clearly than I have ever succeeded in doing, and because he can speak with greater authority than I can, I quote from his article on Chorea in the *second edition* of Reynolds's "System of Medicine." I must mention beforehand that Dr. Russell Reynolds about twenty years ago concluded that the corpus striatum was the seat of lesion in chorea. Dr. Broadbent, and Dr. Russell of Birmingham, arrived at conclusions in most essential respects like mine, both as to seat and nature of lesion in chorea, very soon after my earliest observations. I would particularly draw attention to a masterly article by Dr. Tuckwell of Oxford in the fifth volume of the St. Bartholomew's Hospital Reports.*

"Adopting this theory of embolism, Dr. Hughlings Jackson goes further than Dr. Kirkes had done, and attempts to prove that plugging of vessels, which he regards as the [most frequent] cause of chorea, is in the nerve tissue forming the convolutions near to the corpus striatum—a part supplied by branches of the middle cerebral artery; and that the tissue is thereby not destroyed, but rendered unstable from anæmia, resulting from a diminished supply of blood.† And without doubt the clinical evidence adduced in favour of the view is very cogent. Taking chorea of one side of the body—hemichorea—as the simplest form of chorea, and putting it side by side with hemiplegia the

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* For facts and arguments against the two doctrines I will especially refer to Dr. John W. Ogle's paper, *Medico-Chirurgical Review*, 1868, to Dr. Barnes' article in the Obstetrical Society's Transactions, Vol. X., and to Dr. West's work on the Nervous Diseases of Children. Indeed, the number of medical authorities who countenance the novel doctrines as to chorea is very small.

† When I first put forward arguments to show that Dr. Kirkes' opinions as to the pathology of chorea was correct, I did not know that blocking up of arteries caused hyperæmia; I thought it always led to anæmia. In an article, *Medical Times and Gazette*, March 6, 1869, I have made the necessary correction. The local instability of nerve tissue results from *hyperæmia*, and yet, the nerve tissue will be worse nourished in quality, although more nourished. Thus, so it seems to me, my view of the condition of nerve tissue in chorea is but a modification of that held by Dr. Radcliffe.

result of embolism, good reason is found for believing that the disorder of movement and the palsy both point to the region of the corpus striatum as the seat of the mischief. If this be the seat of mischief in hemiplegia, why not in hemichorea? The muscles most moved in hemichorea are those most palsied in hemiplegia. In hemichorea, as in hemiplegia, the arm, as a rule, is more affected than the leg. In right hemichorea, as in right hemiplegia, the speech is generally very much affected. Again, hemichorea is always more or less mixed up with, and sometimes ends in, hemiplegia; and, on the other hand, hemiplegia from various causes is not unfrequently attended by chorea, or movements of some kind or another, The fact that the face is involved in chorea shows that the seat of the disorder must be above the spinal cord. The facts which have been instanced point to the convolutions near the corpus striatum, rather than in any other part of the brain, as the part affected. In this way Dr. Jackson reasons, and reasons to good purpose, for most assuredly the difficulties which beset any attempt to localize the choreic lesion in the nerve-centres are not a little simplified by thus insisting upon the clinical relations betwixt hemichorea and hemiplegia, as a ground for believing that the region of the corpus striatum is the part affected in both disorders."

The case bears also on the methodical investigation of convulsive seizures. It shows that a man need have no motor symptoms, *i. e.* no permanent motor symptoms, from what is practically an absence of even a considerable part of the motor tract and convolutions. But it is an altogether different thing when part of the brain is not only present but unstable—when there is a discharging lesion, as in cases of convulsions. In the *Medical Times and Gazette*, November 30, 1872, I relate a case of convulsion beginning in the thumb and associated with, and unquestionably dependent on, a tubercle the size of a hazel nut in the hinder part of the third right frontal convolution. Of this I remark: "This tumour, so far as we could learn, produced no symptoms at all *by its destroying action;* for we may safely say that if the third right frontal convolution were simply wanting, there would be no symptoms at all, at any rate no *discoverable* symptoms. But it is altogether a different thing when a 'foreign body' excites 'irritation' and leads to instability of nerve tissue, as this mass of tubercle did. Hence the clearing of the paradox that disease of the brain sometimes does and sometimes does not produce symptoms. The expression 'disease of the brain' is

not precise enough for scientific purposes. A man can *do without* a certain quantity of his convolutions, but he suffers if that quantity becomes unstable, because it will now and then discharge."

The notes of the following case were kindly taken for me by my colleague, Dr. Gowers, and to him also I am indebted for the careful examination of the brain given at page 66.

Edwin G., æt. twenty-one, was admitted into the National Hospital for Paralysis and Epilepsy, May 20, 1870, in the following condition. His mind was perfectly clear. Speech unaffected.

Motion.—His left arm and leg were powerless. The left side of the face was almost motionless in its lower portion, and in its upper could not be moved nearly so much as on the right side. His eyes could be moved in any direction, but were moved to the left with much less facility than to the right: as he lay still, and made no special attempt to move them, they were spontaneously directed to the right. The pupil of the left eye was rather larger than that of the right, though about medium size. The right was more sensitive to the action of light. The tongue could be protruded with ease, but turned to the right. The left side of the chest moved distinctly less than the right.

Sensation.—Sight of left eye not quite so good as of right. Examined with the ophthalmoscope the left optic disc was too red, the outlines indistinct, the veins large and dark. No ecchymoses could be seen. Over the left arm and leg sensation was considerably diminished; a pinch being felt imperfectly, and a touch not at all. Over the left side of the face and body sensation was normal. Tickling the left sole excited moderate reflex movements in the toes and leg, of which the patient was unconscious. The temperature in the right axilla was 99·8°, in the left 100·6°. There was no cardiac murmur, or albumen in the urine.

Onset.—The onset of the paralysis had been as follows:—

For some weeks he had felt out of health, and during the week before the onset he complained of headache, especially severe on the two preceding days, and then constant and chiefly at the back of the head. The evening before his admission he went to bed early, and was found about two hours afterward on the floor by the side of the bed, unable to stand from the paralysis of the left side. He was talking much and wandering. He was put to bed and passed a restless night, alternately wandering and dozing, with one or two brief intervals of consciousness. Of the onset he himself remembers nothing.

The day after his admission he was perfectly conscious and had regained a slight amount of power over the limbs. He could raise the left leg easily from the bed on which he was lying, and could just move the arm. The temperature in the right axilla was 99°, in the left 99·6°.

On the 23rd, his pulse was noted to be slightly irregular in frequency; 60. He complained of some pain at the back of his head. The optic discs were noted as being slightly hyperæmic, edges not sharply defined, but still they presented no great change.

Next day he could move the leg freely, and raise the arm about a foot from the bed, but there was no increase of power in the face. Sensation over the limbs was normal; sight was equal in the two eyes. He thought he heard the ticking of a watch less distinctly on the left side. The irritability of the muscles to faradisation was distinctly less on the paralysed side.

During the next few days there was a rapid increase of power in the paralysed limbs. In other respects his state was unchanged. On the 26th, however, his pulse was noted to be only 47, but regular and soft. On the 28th it was 60, and on the 30th, 50. The amount of paralysis in the face continued undiminished.

On January 4th, he was able to stand alone and to walk with a little assistance. His pulse was 85. The paralysis of the face was a little less.

From this time his progress was uninterrupted. On June 27th, he was able to walk across the room with scarcely a limp. He soon got tired however, and thought that his left leg tired first, and complained that in walking his right calf "knotted up" frequently. He could perform any movement with his arm, but the grasp was feeble. The facial paralysis was much less. The deviation of the tongue was still considerable. There was no rigidity. Electro-muscular irritability and sensibility on the paralysed side still rather lessened. Tactile sensibility normal. The pulse was 80, intermitting occasionally. The heart sounds were healthy. The appearance of the optic discs was the same, ill margined, and of a uniform pink colour, without any physiological cup perceptible.

He left the hospital at the end of June, and subsequently his improvement continued, but some mental change was noticed. He was much depressed in mind without any obvious cause, and would laugh or smile in an unmeaning way. His manner was strange: he generally came into the out-patient room with his

hat on, and held out his hand to shake hands, smiling in an imbecile way.

Later he went to the seaside, and by the beginning of August could walk eight miles without fatigue. The face was nearly equal. The arm not very strong: could move Duchenne's dynamometer to 8°. Mental depression less, but he was still too much "muddled" to go to business. In a short time, however, he improved sufficiently to do so, and continued at work, gaining strength, until January, 1871. There was at this time nothing observable about him except a sort of child-like manner.

In the beginning of that month, without assignable cause, one evening he had a transient attack of giddiness. In the beginning of February he had a slight fit: lost consciousness for about ten minutes, with at first twitchings in the face and then strong contractions in the right arm. On examining the heart a basic systolic murmur was heard conducted up to both clavicles. A few days afterward he had another transient attack of giddiness, commencing with a feeling as if all the blood were rushing up from the left side of his chest. This feeling was repeated occasionally during the next nine months. The murmur at the base of the heart was sometimes inaudible, sometimes was to be heard after exertion.

His mental state regained its ordinary tone.

On February 24th, 1872, he went to some public baths to take a warm bath. He was seen, after getting into the bath, to light a pipe of tobacco and begin smoking. Three quarters of an hour afterward he was found in the bath, under water, dead. The pipe was at the bottom of the bath.

Post-mortem examination, fifty-six hours after death. Present: Dr. Yarrow, Dr. Hughlings Jackson, and Dr. Gowers.

Brain.—Right half apparently rather smaller than the left, the difference chiefly marked in the anterior lobes; more serum beneath arachnoid over right than over left. Arteries at base quite healthy. Middle cerebrals carefully traced out and free from any obstruction. Veins on surface distended (much venous congestion everywhere). Some of those on outer part of right hemisphere are accompanied by a yellowish white deposit on each side. Certain convolutions in the course of the fissure of Sylvius were softened, reduced to half their normal size, very soft, of yellow colour, covered by red, injected membrane. The convolutions thus affected were the following. Those of the outer half of the island of Reil extensively diseased. The third frontal was nearly untouched, only a quarter

of an inch of its posterior extremity was softened. The base of the ascending frontal softened, but the lower end of the ascending parietal was nearly free, only that part of its surface which looks into the fissure of Sylvius being changed. Farther back, along the posterior limit of the fissure, was a more extensive area of disease, destroying the middle and lower parietal convolutions, and extending as far as the commencement of the occipital lobe. The branch of the middle cerebral artery lying in the posterior limit of the fissure of Sylvius, and sending twigs at various points into the softened area, was apparently quite healthy.

On opening the brain an area of destroyed brain tissue was found situated just outside the corpus striatum. In its centre was a small cavity containing some yellowish brown fluid: a thin film separated the cavity from that of the lateral ventricle. The cavity was surrounded by softened tissue, greyish-brown in tint, somewhat darker than that of normal grey substance. The softened area extended from half an inch beyond the anterior limit of the corpus striatum, nearly to the level of the posterior limit of the optic thalamus. Opposite the middle of the corpus striatum it was about an inch or rather more from side to side, but became smaller as it passed backward. This softening was continuous with that in the outer half of the island of Reil, but although in its backward extent it followed a course parallel to that of the softened area in the fissure of Sylvius the two were separated by nearly healthy white substance.

The state of the central ganglia was as follows. The optic thalamus seemed intact, and not encroached on by the softening, although rather smaller than that of the opposite side: its appearance was tolerably healthy. The walls of the descending cornu of lateral ventricle were healthy. *Nearly the outer half of the corpus striatum was destroyed.* Quite half of the intraventricular nucleus was destroyed, but not nearly so much of the extra ventricular nucleus; indeed only a small area at the outer part of this would seem to have suffered. The white fibres separating the two passed in a softened state across the cavity outside the corpus striatum. Opposite the middle of the corpus striatum, in the edge of the softened area, was a small white irregular mass, the size of a pea, of firmer consistence, like a dryish piece of curd. Some similar smaller masses occurred in the softened convolutions of the fissure of Sylvius. Microscopically it contained the *débris* of nerve elements and granular corpuscles. The softened areas presented everywhere

a similar composition, fragments of nerve tubules, granules and globules of fat, and granular corpuscles, with a variable quantity of blood corpuscles, but no blood crystals. Rest of brain healthy.

Heart.—Valves and muscular substance healthy, a few white patches in commencement of aorta. Right side distended with blood. Other organs healthy, but presenting extreme venous congestion. No evidence of embolism in any abdominal viscera.

ON THE MICROSCOPICAL CHARACTERS OF THE SPUTUM IN PHTHISIS.

By John Denis Macdonald, M.D., F.R.S.,
Staff-Surgeon R.N., Assistant Professor of Naval Hygiene, Netley Medical School.

It is a question whether, with all our progress in pathology, we can satisfactorily diagnose incipient phthisis by the microscopical characters of the sputum alone. Critically similar appearances are presented in the sputum of chronic hæmorrhagic catarrh, and in a very frequent sequel of ordinary pneumonia. Indeed there can be but little doubt, that, under the designation of Phthisis, at least several distinct maladies are commonly included: and some of these even tend to the destruction of the lung tissue in a manner scarcely to be distinguished from the process of ulceration occurring in connection with softened tubercle. Nevertheless, the detection of this tissue in the expectoration is perhaps the clearest diagnostic mark of phthisis that the sputa can afford. Professor Bennett's case of the discovery of elastic lung tissue under the microscope, prior to the development of true phthisical symptoms, appears to have been followed by few, if any, other good examples of the kind. There is, however, great promise that with improved methods of examination, as, for instance, the process recommended and so successfully practised by Dr. Fenwick,* much may yet be done to elucidate this important point. It usually happens that at the time we are able to trace such anatomical elements in the sputa, the disease has sufficiently manifested its real nature by other attending signs and symptoms. It seems to be generally admitted that the characters of the elastic tissue of the air-cells are so distinctive, that there is little likelihood of anything else being

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* See *Lancet*, December 5th, 1868.

mistaken for it, and it is quite true that an experienced microscopist may not confound other fibrous tissues with it. But the tyro must be made aware that many things of an extraneous nature will be sure to deceive him, unless he makes himself acquainted with the minute anatomy of the air-cells, more especially with the microscopical appearance and mode of distribution of their supporting fibrous tissue.

The accompanying Figs. 1 and 2, are selected for the guidance of those who may not be familiar with the structure of the air-cells. The first represents a portion of inflated and dried lung, showing the comparative size and general disposition of the air-cells, as seen with a half-inch power. The second was drawn from a small portion of recent lung divested of its epithelium, and treated with acetic acid to render the investing tissues more transparent and thus to display the fibrous basis more distinctly (magnified about three hundred diameters).

Should tubercular matter be deposited in the cells themselves, or between the layers of the basement membrane in contact with the fibrous tissue, the irritation thus induced will sooner or later lead to inflammatory action and the development of its products, lymph and pus. With the central softening and ultimate breaking down of the tubercle, an ulcerative process is set up, by which fragments of pulmonary tissue become detached and are expectorated with the surrounding pus and mucus from the bronchial membrane. Such fragments are therefore commonly to be found in the sputa of persons affected with phthisis, and the credit of having first discovered them by the aid of the microscope belongs to Professor Schroeder Van der Kolk, who in 1846 first published his observations on the subject, and gave a fresh impetus to the labours of Dr. Andrew Clarke and others in this country. How soon after the accession of the malady, portions of lung tissue may be detected in the sputa, is yet a question to which no definite answer can be given, but at an advanced stage there is often very little difficulty in finding them. Thus Fig. 3 represents some fragments of fibrous tissue taken from a small quantity of greenish purulent mucus brought away with a single effort, but supposed by the patient, who had himself been a nurse, to be of some import, judging from his own sensations when it was expectorated. Patients frequently direct attention to particular portions of their sputa under a similar impression.

As to the various modes of discovering the presence of lung

tissue in large or small masses of sputum some remarks may be made here.

First of all, some difficulty may be experienced in removing suggestive morsels from the mass, on account of the viscid and ropy nature of the surrounding mucus, more or less imbued with pus. For this purpose Mr. Sansom has invented sharp spoon-blade forceps, which will be found most effective and useful; with this instrument small portions may be easily taken from different parts of the sputum, and separately examined. By careful compression, the mucus and pus corpuscles, young and old epithelial cells, may be reduced to a thin film having a homogeneously granular appearance, in the midst of which any lung tissue present may be distinguished by its continuity and high refractive power as compared with that of the ground. The addition of a little acetic acid, however, will, on the principle previously explained, bring it out still more clearly.

When the quantity of expectoration is large it may not be easy to make a selection of suitable portions for examination, but by boiling the whole mass in caustic alkali the ropy plasticity of the mucus is reduced to a limpid fluidity, with the total destruction of the mucus and pus corpuscles. Any indestructible tissue present, such as cotton and linen fibre, the elastic tissue of beef or mutton used as food, or, what concerns us most, the fibrous tissue, &c., of the patient's lungs, will be deposited at the bottom of the vessel, from whence they may be readily removed with a pipette, and placed under the microscope. Besides the elastic tissue, which exhibits some slight change in its appearance by this treatment, we often find portions of the basement membrane of the air-cells and smaller bronchi, and even fragments of the bronchial radicles themselves, with unequivocal though faintly marked rings. (Fig. 3a.) By pouring the sputum, thus reduced, into tall conical glasses such as are used for urinary deposits, all the solid matters will quickly settle at the bottom, so that some little discrimination may be required to distinguish true lung tissue from other substances with which it is often entangled. Moreover, the sooner the deposit is examined the better, for by long standing, especially if there has been blood in the sputum, light cloudy films, which first occupy the upper part of the fluid, finally gravitate upon the tissue, and obscure it to a considerable extent when removed with a pipette and placed under the glass. The remedy for this, however, is shaking and re-precipitation. For the operation here alluded to, a small beaker

adapted to the ring of a retort stand, a glass rod for stirring, a spirit lamp, a bottle with solution of soda, a tall champagne glass, and a pipette, are all the apparatus required.

When the case is complicated with much bronchitis, the first part of the expectoration with a fit of coughing usually consists of frothy mucus, after which it gradually becomes more dense and purulent, and better suited for examination. By receiving the sputum directly into the beaker at this period, much trouble may be saved, and there will be less chance of contracting impurities from without.

The more ordinary components of the sputa in phthisis are represented in Fig. 4, and are particularly noticed in the explanation of the Figures.

Fig 1.

Fig 2.

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PLATE I.

EXPLANATION OF THE FIGURES.

Fig. 1.—A portion of lung, inflated and dried, in order to show the general arrangement and comparative size of the air-cells as seen with a half-inch power.

Fig. 2.—A portion of recent lung, divested of its epithelium and treated with acetic acid, so as to show the yellow elastic element and the nuclei of the white fibrous tissue more distinctly.

PLATE I.

EXPLANATION OF THE FIGURES.

Fig. 3. (a)—Lung tissue obtained from the sputum of a phthisical patient, by boiling in caustic soda, as described in the text. At * are one or two portions of minute bronchial tubes, with the rings faintly but unequivocally visible.

(b) Another specimen from the same sputum, with a strip of bronchial basement membrane and subjacent elastic tissue.

Fig. 4.—The more ordinary components of phthisical sputa :—

(a) So-called exudation cells, filled with fatty granules, and occasionally speckled with pigment.

(b) The liberated contents of (a), the globules in some instances running together.

(c) Mucus corpuscles.

(d) Pus corpuscles.

(e) Blood corpuscles.

(f) Epithelial scales.

(g) All the foregoing materials, with a basis of pure glairy mucus, exhibiting a striated appearance; and an alteration in the figure of some of the corpuscles by pressure and traction, showing the plastic nature of their contents. The mucus, pus, exudation, and epithelial cells are but modifications of the same essential organism.

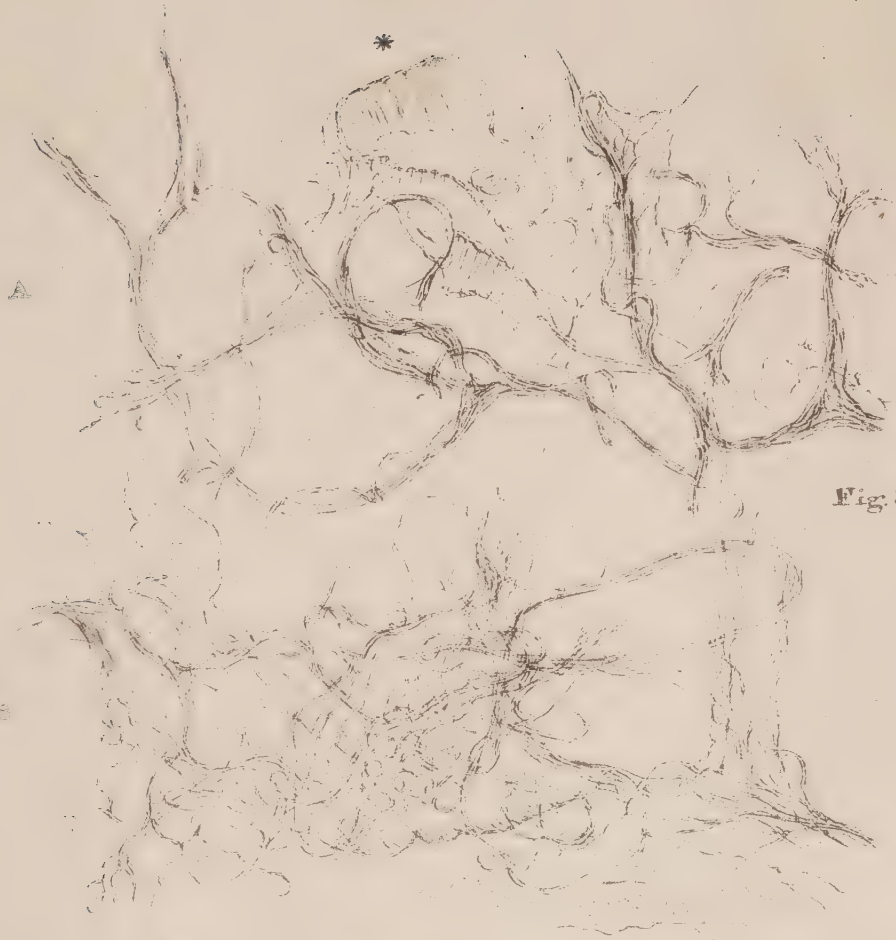

Fig. 3.

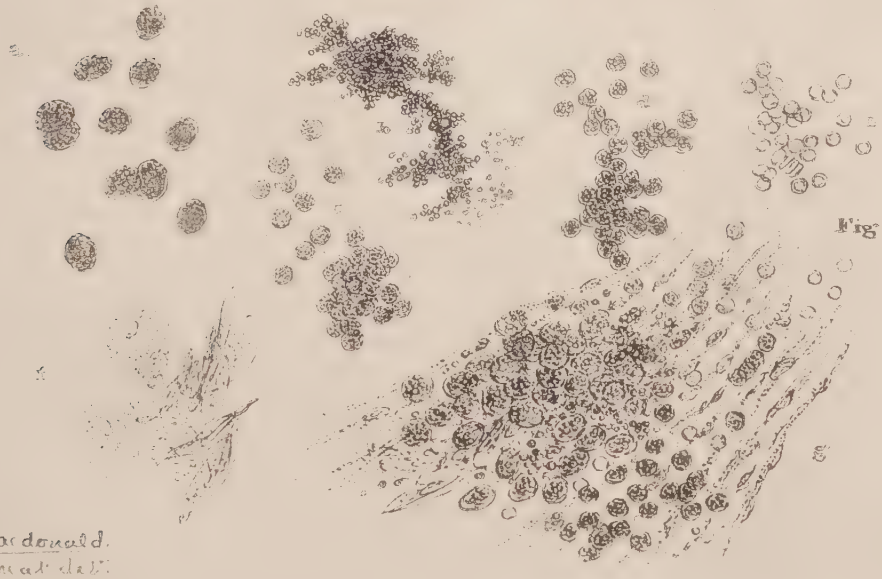

Fig 4.

J. Macdonald.

INSANITY IN RELATION TO SOCIETY.

By F. Needham, M.D., M.R.C.P. Edin.,

Resident Medical Superintendent of York Lunatic Asylum.

At a period in the history of this country at which upwards of sixty thousand persons are registered as insane, and their proportion to the population has reached one in every three hundred and eighty-seven, it will, I think, scarcely be considered requisite that I should apologize for the introduction of the subject which heads this paper, and which so painfully asserts its own claim to general interest and consideration.

Previously to the year 1845, in which the Lunacy Act, appointing special Commissioners, was passed, although various statutes were in existence, dating from the time of Edward II. downwards, affecting the property or persons of the insane, no provision had been made for their proper registration and supervision.

From that time, however, to the present, more or less careful returns have been made, and of late years, at all events, these have assumed a degree of accuracy and fulness which entitles them to a large amount of reliance and weight. I say a large amount only, because it is well known that no statutory system of registration of insanity can be absolutely perfect; since numerous cases of the disease must constantly occur, pass away, or continue, without their existence being known or suspected beyond the families or circles in which they arise.

The returns, however, are sufficiently accurate for reliable statistics to be drawn from them, and these statistics are of such a character as to demand from us the most careful and considerate attention.

In the year 1859, the system of registration under the Lunacy Acts having been in active operation for thirteen or fourteen years, the proportion of insane to population was stated to be 1·86 in 1,000, or one in 540; in 1864 it had risen to 2·15; in 1869 to 2·43; and in 1873 it stands at 2·58, or one in every 387. In 1863,

8,914 persons were newly registered as insane, or one in every 2,305 of the population. During the year 1872, 12,176, or one in every 1,918 were so registered.

The facts in this statement which I wish especially to bring into relief are two.

(1) That under an efficient system of registration, in equal operation throughout the whole time, the proportion of registered insane persons to population has increased from 1·86 per 1,000 in 1859 to 2·58 in 1873, or, to put it otherwise, from one in every 540 to one in every 387; and (2) That whereas in 1863, only ten years since, but one person in every 2,305 of the population was newly placed under inspection as of unsound mind, in 1873 this proportion had risen to one in every 1,918.

At first sight these facts would seem to indicate, without doubt, that of late years insanity has made an extraordinary development, quite disproportionate to that of the population; and in this conviction many competent persons coincide, after a careful and analytical investigation of the facts; but, on the other hand, an equally numerous, and not less able, body of persons assert that such is not the case; that the increase is only apparent, and depends upon circumstances which are easily explainable. The latter raise into an active and largely efficient cause of the apparent increase the greater degree of accuracy in the returns of, and the more perfect means of discovering and registering, cases of insanity. To this, answer is made, that such a plea would have come with much force in the early years of the Lunacy Laws, when their machinery was more or less imperfect; but can scarcely be sustained as operative, in more than a minor degree, after thirteen years of vigorous work.

Again the apparent increase is attributed to the improved treatment in asylums, causing increased longevity of the inmates, and a growing residuum remaining under care. It is not denied that this is an important agent, as affecting the ratio between the registered insane and the population; but it is plain that it can, in no manner or degree, influence the admission of patients, and cannot, therefore, account in any measure for their increase from one in 2,305 to one in 1,918 in the short space of ten years.

But it is said that this increase of admissions depends mainly upon three circumstances: a growing appreciation on the part of the public of the benefits of asylum treatment; increased facility

for the discovery and committal of insane persons; and a widening of the interpretation of the term Insanity.

The material influence of these agencies is not disputed, but it is contended that they are quite incapable of producing results of the magnitude referred to: (1) Because it is a fact that the friends of insane persons, especially among the lower orders, are by no means so ready as could be wished to give them the benefits of asylum treatment so long as it is in their own power to maintain them at home; and (2) Because the general prosperity of the country of late years has not only added largely to the capacity of persons to exercise such retention, but has favoured the employment of those feeble and half insane persons who in less prosperous times would have been excluded from it and probably become actually insane, in obedience to laws, the operation of which I shall endeavour subsequently to illustrate.

Professor Griesinger of Berlin, a man eminently qualified to form an opinion upon any question relating to insanity, sums up the matter in the following decided words.

"It may be considered *possible* that the constantly increasing number of the insane, which is almost universally remarked, is only apparent, and that it is owing to the increase of the population, the great attention now paid to mental diseases, the more exact methods employed to ascertain their existence, and to the circumstance that all improvements in asylum matters lengthen the period of life among the inmates, thereby causing the admissions greatly to exceed the number of deaths, and the patients to consequently accumulate.

"It is, I say, *possible* that it may be so, but very *improbable*; and I would rather coincide with the opinion of most medical psychologists that the increase of insanity in recent times is real, and quite in accordance with the relations of modern society."

Whatever other result the facts and arguments which I have thus adduced with reference to this disputed question may produce upon the minds of those who consider them, I venture to think they will leave there no doubt as to the importance of the subject which forms the title of this paper; and I shall now, in pursuing it, endeavour to point out some of the influences which seem to operate most strongly in the causation of the insanity which prevails to so large an extent amongst us; to show their modes of operation; and to suggest, either directly, or by inference, such measures as evidently lie within our reach of

checking the production of an evil which is reacting with serious energy upon society.

Whether or not insanity prevails to an equal extent in civilized and uncivilized countries—that is, whether it is or is not a disease specially attendant upon civilization—remains, as it has ever done, a question to which no satisfactory answer can be given, inasmuch as the information obtainable with reference to barbarous peoples is small and unreliable, in spite of the decided statements of Esquirol and Fodere, that "insanity belongs almost exclusively to civilized races of men, scarcely exists among savages, and is rare in barbarous countries."

We may, however, concede that at all events the development in the two classes of persons will be in different directions, and that where there is a higher organization and a more complex mental condition, there the morbid mental manifestations will assume a more active and definite form, and *vice versa*. This is undoubtedly true not only of civilized and uncivilized nations, but of rural and urban populations. Amongst the one, idiocy, imbecility, and other evidences of imperfect development and activity will predominate; amongst the other, mania with delusion, acute melancholia, and the results of mental strain and overwork.

It would appear that real civilization, using the term in its best sense, tends rather to prevent, than to promote, insanity; for with the spread of true civilization ignorance and prejudice are dissipated, and, as Sir James Coxe truly says, "insanity is a disease of ignorance."

In this statement we have at once the key note of the causes which originate, and of the remedies which suggest themselves for the cure of, the evil. If ignorance and its followers are injurious, as they undoubtedly are, true education and its successors are best calculated to repair the injury, or prevent its recurrence and extension.

Hence it becomes important to enquire how this ignorance is manifested, what are its results, and in what manner they can be met. And in the first place it may be stated broadly that the system of education in this country is almost as bad as it can be made. I do not of course refer to the new School Board scheme, which is only just entering upon its trial, but to that system of education which has been in operation for so many years, and has made us what we are educationally. Among the higher classes what is called education begins at an early age, too often while the

brain is scarcely fully developed, and certainly before it can safely bear any great strain or prolonged exercise, and consists of cramming into it the largest amount of heterogeneous information which that unfortunate receptacle can be made to contain. Meanwhile physical development is made a matter of chance, and that health of organ which means health of ideas and morals is either not regarded at all, or regarded as of only secondary importance.

In the case of girls the state of things is even worse than this, and that girl or school which comes out of the struggle without some scars is to be congratulated upon a victory of no ordinary rarity. There are, of course, happy exceptions to this general rule, and I know of schools where physical training is attended to, and the emotions are not suffered to develope at random, but directed into proper channels, and kept within healthy bounds. These exceptions, however, unfortunately only prove the truth of what has been said by an eminent authority upon this subject, that "our English education of the higher classes is not a system, it is a chaos. There is little adaptation of means to ends, because there is no general agreement as to the ends which have to be attained."

Among the lower classes the education of the past has been little better than a farce and a hindrance. Mr. Joseph Payne tells us that "of the children educated in 1866-7 two out of every three, on leaving school, could not read fluently; could write but very imperfectly; and could do none but the most elementary arithmetical sum. Only one child in sixty-three, or 15,000 out of 945,000 could pass an examination lower than the lowest Prussian, Saxon, or Swiss standard." In the words of Dr. Lyon Playfair, "What we call education is the mere seed used in other countries; but with us that seed, as soon as it has sprouted, withers and dries up, and never grows into a crop for the feeding of the people." Mr. Mathew Arnold, no mean authority, is still more emphatic. He says "Such an education leaves our young men of the upper classes, Barbarians; of the middle class, Philistines; of the lower class, Heathens."

With such a primary education as this it is needless to say how small is the prospect of any scientific training, and how lamentable must be the ignorance which cannot but prevail.

That some considerable influence is thus exercised upon the production of insanity would seem to be shown by the fact that in Scotland, where the general insanity-producing causes are certainly

not less than in England, but where every peasant has the chance of acquiring such knowledge as will enable him to aspire to the Universities, at which, out of 3,500 students, 500 now there are actually the sons of artizans and peasants, the ratio of insane to population, instead of being, as in England, one in every 387, is only one in about 429. This fact I give for what it is worth.

I have shown how the poverty of public education in England operates in limiting the possibility of scientific instruction, but, unfortunately, the absence of such studies is not confined to schools for the lower classes. Physiology, as comprising those laws upon which physical, mental, and moral health depends, is scarcely taught at all in our schools, or studied by any, unless as a necessary means to a professional or examinational end.

The number of those who make it their study from a desire to know, and be able to regulate, the conditions upon which they can retain health and ward off disease, is extremely limited; and even the classes in our Mechanics' Institutes, where such information is supplied gratis, or on a nominal payment, are suffered to languish and die from pure lack of interest and attendance.

Now that the public health has received tardy recognition, as deserving of public attention and control, it is to be hoped that this state of things may cease, and that sufficient interest will be excited to induce *individuals* to apply personally the lessons which will be everywhere publicly taught, so that ultimately the duty of those who now seek to enforce measures for the preservation or improvement of the public health may be confined to the simple direction of efforts made by the public for the general good. It is certain that without some knowledge of hygienic physiology the full force and bearing of healthy or unhealthy conditions of life can never be appreciated. It would seem no more absurd to say to a blind man, "Preserve your sight," than to tell one, ignorant of physiological principles, "You must, if you would be in health, escape blood contamination, by breathing pure air and avoiding all excess;" and yet this ignorance is so general that it is rare to meet with any one of ordinary education who possesses even an elementary knowledge of physiology.

Sydney Smith has a very amusing but thoroughly practical article upon the importance of attention to hygiene, a part of which is worth reproducing here. "The longer I live," he says, "the more I am convinced that half the unhappiness in the world proceeds from inattention to corporeal management. In this point of view the care of

the body becomes a subject of elevation and importance. My friend sups late; he eats some strong soup, then a lobster, then some tart, and he dilutes these esculent varieties with wine. The next day I call upon him. He is going to sell his house in London, and retire into the country. He is alarmed for his eldest daughter's health. His expenses are hourly increasing, and nothing but a timely retreat can save him from ruin. All this is the lobster; and when over-excited nature has had time to manage this testaceous incumbrance, the daughter recovers, the finances are in good order, and every rural idea is effectually excluded from the mind.

"In the same manner old friendships are destroyed by toasted cheese, and hard salted meat has led to suicide. Unpleasant sensations of the body produce correspondent sensations in the mind, and a great scene of wretchedness is sketched out by a morsel of indigestible and misguided food. Of such infinite consequence to happiness is it to study the body."

This study, as I have already shown, is unfortunately but little cultivated; and if the old adage be true that "A man is either a fool or a physician at forty," it is to be feared that the majority of the male population of the United Kingdom who have reached that age cannot be designated by a term which is indicative of wisdom. The fact would seem to be that, during health, disease appears so remote, and health so permanent, that the former can require no warding off and the latter no preserving, and hence habits the most pernicious are indulged in with the freest licence, the laws of nature are outraged, and disease supervenes.

Of these habits, that of intemperance assumes an unfortunately influential position; and to it many cases of insanity undoubtedly owe their origin. Of 1,029 patients admitted into the York Asylum, intemperance was, I am satisfied, the principal cause of the attack in nearly one sixth of the number; and in a very much larger proportion of the cases it was assigned as the cause, and no doubt had a co-operative influence. I do not forget that intemperance is frequently credited with the causation of insanity, where it has only operated in a secondary and minor degree, and been really more a result than a cause, but in my calculations I have fully allowed for this circumstance, and carefully eliminated all cases in which this cause did not seem to be clearly and undoubtedly established as primary.

It is given as the cause in one third of the whole of the admissions into American asylums, not, however, without protest

from Dr. Ray; and out of 286 patients confined in the Richmond Asylum near Dublin, Macnish calculated that one half were drunkards.

Parchappe asserts that twenty-eight per cent. of the cases of insanity at Rouen were due to the abuse of stimulants; and Bonacassa found the proportion of insane drunkards at Turin to be twenty-two per cent. among the men, and in Holland eleven per cent.

In Berlin, every third case of insanity among the working classes was attributed to intemperance; and in Sweden, Professor Huss states that about half the number of insane males have been intemperate.

Dr. Wilson affirms that of from sixty to seventy men admitted into the Asylum at Stockholm, only ten were insane from other causes than drunkenness; and in the Great Asylum at St. Petersburg, out of 997 patients admitted during ten years, 837 were said to have been reduced to a state of insanity directly or collaterally by this vice; while out of 350 patients admitted into the Charenton in the two years 1857-58, 102, or 29·1 per cent., were caused principally, if not absolutely, by alcoholic drinks.

These statements, all of which are vouched for upon what is believed to be undoubted evidence, show how largely this vice enters, both in this and other countries, into the causation of insanity; and there are many reasons why this should be the case. It produces actual physical disease of the organ upon which the manifestations of mind depend, as well as a deleterious influence, through other organs, upon the blood, whose uncontaminated condition is essential to the satisfactory discharge of both physical and mental processes; it excites the emotions and passions, and indisposes and unfits for intellectual exercise; it lowers self-respect, and weakens volition; and it tends to render life uncomfortable and irregular, and plunges its victims into privation and poverty; superadding the important physical depressants, hunger, sleeplessness, and impaired nutrition. Within recent times, this vice has decreased largely among the higher classes, and there is no reason to believe that among them insanity has increased at a greater rate than that of the population. There is, however, I believe, much to fear in the future from the habit, which is growing, of taking stimulants at frequent intervals during the day, to supply a supposed necessity of the system, or to gratify a depraved taste; for it must be remembered that it is not so much the *drunkard* who

suffers from nervous degeneration, as the *drinker*, the man or woman who is ever over-stimulated, but perhaps never drunk. Among the lower classes drunkenness has, unfortunately, made a considerable advance within recent years.

The average consumption of malt per head has increased materially, and the income from the spirit duty, which Mr. Arthur Arnold calls "the financial barometer of our prosperity," has been steadily augmenting from year to year. In the half year ending June 30th, 1873, the quantity of spirits retained for home consumption in the United Kingdom was 13,429,098 gallons, as against 11,324,865 gallons in the corresponding period of 1871.

The influence of the new Licensing Act has no doubt been considerable, and will probably increase, for although it may to some extent be true that you cannot make people sober by Act of Parliament, you can make drunkenness penal and so disgraceful, as has been done so successfully in Canada, and you can limit the facilities for obtaining drink, and gradually substitute the taste for other beverages in place of that for intoxicating liquors. This was clearly shown by the introduction of tea, for when the annual consumption of that article had reached four pounds per head the consumption of malt declined one half.

It is, of course, of very little use to pass restrictive measures limiting the hours of closing public houses unless they are carried out in the spirit in which they were conceived. A wholesale extension of hours brings us to the point from which we originally started. Where, however, the Act has been legitimately carried out, the opinions are almost unanimous in its favour. Thus in Birmingham, Bradford, Dudley, and other large towns, and a multitude of small ones, the Superintendents of Police report a very marked improvement in their sobriety and public decency.

In Sweden, where a Licensing Act was passed in 1865, the change is described as most remarkable. In Gothenburg alone, the number of persons fined for drunkenness declined from 2,161 in 1864 to 1,416 in 1870, while the cases of delirium tremens have been diminished one third, and this, too, in spite of a rapidly increasing population. The wave of drunkenness which the prosperity of trade or some other influence caused to pass over the civilized world in 1872, by no means spared Sweden, but although the convictions for drunkenness in 1872 largely exceeded those in the two previous years, they bore no disproportion to the increase of population. In 1864 the per-centage of cases of drunkenness to

population was 6·10; in 1865 (the Act having come into operation in October) 5·57; in 1866, 3·75; in 1867, 3·58; in 1868, 3·50; in 1869, 2·56; in 1870, 2·52; in 1871, 2·67; and in 1872, 2·72. The chief feature of the Gothenburg system, which has been fully described by Mr. D. Carnegie of Edinburgh, is the farming, to a responsible company, of all the spirit licences in the place, and the restriction by it both of the number of public houses and the cheapness of spirits. A reduction of the per-centage of drunkenness from 6·10 to 2·72 shows what a mighty influence it has exercised over the prevalence of the vice. Unfortunately, in this country, the defective education of the working classes and the prosperity of trade have combined to diminish the salutary influence of an imperfect Licensing Act. High wages and ample leisure, without the knowledge how to use them aright, are by no means an unqualified blessing. This has been remarkably exemplified in the experience of the Glamorgan Asylum, which I will relate in the words of its Superintendent.

"The wealth and prosperity of Glamorganshire," he says, "are largely derived from coal and iron, and any arrest in their production and export is immediately and widely felt. During the last six months of 1871, and the first three months of 1873, the mines, and consequently the docks, were deserted by reason of the strikes, and the effects of these strikes on the insanity and crime of the county were most marked and instructive. In the first six months of 1871, forty-seven men and thirty women were received as patients into the Asylum; but only twenty-four men and twenty-six women in the second six months of the year. In the last three months of 1872, twenty-one men and twelve women were admitted, but only ten men and twelve women in the first three months of 1873.

"It is thus shown, by a double proof, that during a strike the male admissions fall to half their former number; the female admissions being almost unaffected. This decrease is doubtless mainly due to the fact that there is no money to spend in drink and debauchery. On enquiry at the county prisons I find that there was a marked diminution in their male admissions during the same periods, so that the production of crime, as well as insanity, is greatly lessened while the strikes continue."

This, too, in spite of the fact that at such times the admissions into the Asylum must be swelled by the difficulty which arises in

that maintenance of insane relatives at home which prevails so largely in prosperous times.

Of course the strikes referred to by Dr. Yellowlees were only of short duration. A prolonged strike, by inducing poverty, would bring to bear insanity-producing influences which I shall have occasion to refer to subsequently. The late Dr. Thurnam, of Wilts, a very competent authority, says "It is to be feared that the increased wages now in many places paid to the agricultural labourer, are of little real advantage to the recipients, but rather to the licensed keepers of public houses, who profit by the large expenditure in drink." This is quite the experience of colliery and other districts, where a high rate of wages prevails, and it is probably almost universal. In a recent report for a division of the West Riding, the Chief Constable bears similar evidence in the following decided words. "I am sorry to say that during the year there has been a large increase of drunkenness in the mining division of the county. This, in my opinion, may be attributed to the large increase in the wages, less hours of work, and to more spirit-drinking than formerly."

As I have already remarked, the prejudicial influence of intemperance in the production of insanity is not confined to the mere physical effects of alcohol upon the system, but depends largely upon the pauperism which results from the direct expenditure of means or loss of capacity for work in the one generation, and the impaired or depraved mental standard in that which succeeds it. Intemperance and insanity are both strongly hereditary, and seem to be convertible in the offspring. The two, by deterioration of the nervous structure of the brain, and lowering of the mental capacity, limit the power of the will, and create a tendency to insanity or other forms of moral or mental obliquity. Dr. Howe, of Massachusetts, found that of three hundred idiots whose histories he had traced, one hundred and forty-five were the children of drunken parents.

It must be evident that with a lower standard of mental power the capacity for remunerative work becomes more and more diminished, and social degradation follows as a matter of course, until ultimately the lowest stratum is reached, and pauperism attained. That intemperance largely causes this declension, either directly or mediately, I have already endeavoured to show, but it is by no means the only factor in the process. Ignorance still steps in, and exerts its baneful influence. Nay, intemperance is too often

the effect of that combination of which ignorance is the cause. With crowded dwellings, the exclusion of fresh air, the neglect of ablution and other hygienic measures, what wonder that depression ensues, and drink is sought as an easily obtainable remedy! What wonder that lethargy steals away every sense which is not purely animal, and destroys all power of resistance!

Thus it comes to pass that poverty is reached with its deficient food, and depraved bodily condition, and finally we get that growing correlation between pauperism and insanity which is so marked a feature in the statistics of our day, but with reference to which it must not be overlooked that insanity is a rapid pauperiser, and that when a person belonging to the middle class, with no other capital than his brains, is attacked by it, he must, after his means, and the assistance of his friends, are exhausted, gravitate to the pauper level, and swell the ranks of pauper lunacy.

The total number of paupers in England and Wales in 1873 was 890,372; the total number of pauper lunatics 53,273; and the percentage of pauper lunatics to paupers 5·98, as compared with 3·66 in 1859. In Scotland there were in 1872, 2,314 paupers in every 100,000 of population, and 8,189 pauper lunatics to every 100,000 paupers; or, to bring it to the English standard, 8·189 pauper lunatics to every 100 paupers.

The statistics of both countries show, that, whereas pauperism itself has diminished largely of late years, in consequence of general prosperity, the lunacy associated with it has made rapid progress.

My friend, Dr. Clouston, has shown that the closest approximation exists between pauperism and lunacy, and that where in series of counties pauperism is above the average, lunacy shows a corresponding excess, with certain exceptions which admit of satisfactory explanation: and he compares, with startling results, the wealth of the labouring classes in the various counties, as shown by the ordinary scale of wages paid to them, with the rate of lunacy in the same counties. "In all the northern counties," he says, "the rate of wages is good, and in them all, whether agricultural or manufacturing, the rate of lunacy is low; while the southern and midland counties of Somerset, Dorset, Wilts, Gloucester, Worcester, Oxford, Hereford, and Berks, where the wages are very low, produce far above the average amount of lunacy.

"Taking for comparison, two parts of the same county differently situated in regard to wages, the poor man's wealth, namely rural Gloucestershire and Bristol, we find that while Gloucestershire with

its labourers, too poor even to go where they could get double wages, produces insanity at the rate of 3·3 per 1,000 of its population, rich Bristol has only a rate of 1·7 per 1,000, or about one half as much. To show that this is not owing to mere employment or the influence of town life, let us look at Newcastle as compared with rural Northumberland. There we know the agricultural labourers are better off and more comfortable and get better wages than their class in any part of England. Newcastle had in 1871, 2·2 lunatics per 1,000. The rest of Northumberland had only at the rate of 1·9 per 1,000. As might naturally have been expected, the country shows itself more healthy than the town as regards even the production of insanity, other things being equal; and no doubt the chief of all these other things are good wages and all that they imply."

I have elsewhere shown that high wages do not bring with them unqualified advantage unless there is the requisite wisdom applied in their disbursement, but, other things being equal, prosperity and the absence of poverty do influence the insanity-producing power of a district in a marked degree, because they assume the possibility of an escape from crowded dwellings, deficient food, and the general insanitary conditions which predispose to disease.

That such conditions of life do favour the production of insanity there can be no doubt; indeed there is the best evidence to show that their influence is of the first importance. It will be remembered that the per-centage of lunatics to paupers in Scotland was 8·189, and in the report of the eighth decennial census for Scotland it is stated that "Very nearly a third of the population live in houses of one room. Much more than two thirds, viz., 69·54 per cent., live in houses of one or two rooms; while 82·11 per cent. live in houses of three rooms and under; and if we reckon all the persons living in houses of one, two, three, or four rooms, it is seen that 88·05 per cent. of the population live in such houses."

Even the benefit derivable from having three or four rooms is neutralized by the reckless folly of the people. To continue in the words of the report with reference to such houses, "They were built with the idea that the sexes would be better separated, and the decencies and moralities of life would be better observed; but, on the other hand, hard stubborn facts prove to us that very nearly a third of the families living in houses of three or four rooms let their spare apartments to strangers, and thus, within the door of the same house, the sexes of different families meet, instead of such house being inhabited by one family alone. The result is, that, in Edinburgh, of

12,521 persons who occupy houses of two rooms, 8,638 are members of the family, and 3,883 lodgers; and that of 10,593 persons who occupy houses of three rooms, 7,181 are members of the family, and 3,412 lodgers. In Glasgow, again, of 62,705 persons who occupy houses of two rooms, 42,173 are members of the family, and 20,532 lodgers; and of 26,557 persons who occupy houses of three rooms, 17,259 are members of the family, and 9,298 lodgers. Indeed this practice of receiving lodgers is a common one even with families living in houses of no more than one room. For instance, in Glasgow, of persons occupying houses of this kind, 12,143 are members of the family, and no less than 7,638 lodgers."

I have taken the statistics of Scotland in illustration of this part of my subject, because the English census returns give nothing in a form so suited to my purpose, but there is very little doubt that in this respect the condition of England is in no material degree better than that of the sister country. We may get a general idea of this from the facts that, while, at the last census, there was an average of 4·98 persons to a house, eighty-two per cent of the houses were below the annual value which would have subjected them to assessment for the inhabited house duty.

In a report just issued on the sanitary condition of the Hackney district, Dr. Tripe, the medical officer of health, states, that "there have been thirty-one cases of overcrowding discovered which were so bad as to be injurious to health. Among these were the following:—At 15, Duncan square, in four rooms, the largest of which had a cubical capacity of 1,020 feet, and the smallest 763 feet, there were four families, one of which, consisting of the mother, a son of twenty-one years, a daughter of sixteen, and two younger children, lived in a single room. In 10, Duncan square, the father, mother, and six children under twelve, inhabited one small room, containing 868 cubic feet of air. At 11, Sheep lane, the mother and father slept in one room, and a son of twenty years old, a daughter of eighteen, another of sixteen, and a lad of fourteen, slept in another small room. In Farm place, Cottage lane, there were several instances of families residing in rooms with but little more than 100 cubic feet of air for each person. In Shacklewell row, the father, a son of twenty-one, another of nineteen, and a grown-up daughter, lived and slept in a room the cubic contents of which was only 904 feet. In a room having a capacity of 766 feet, situated in Taylor's buildings, a man and his wife, two children

under ten, and a woman who was not related to either, were found living and sleeping."

If one may judge from statistics recently published by Dr. Newett, the large Irish towns are in no degree better than those of the other divisions of the United Kingdom, for he found that in four dwelling rooms, taken from a mass of similar places in Belfast, inhabited by flax workers, thirty-six persons were living with a space of only 140 cubic feet to each person. They consisted of four married couples; seven women; four girls, and four boys, from ten to sixteen years of age; and thirteen young children. An average of nine persons to a room.

The ascertained houseless class amounted in 1871 in England and Wales to 10,383 persons.

Nothing can be worse than the voluntary or enforced association of the sexes which these statistics indicate. Not only must overcrowding, and consequently impurity of air, be at their worst, but demoralization must proceed at a rapid rate, and modesty and even the sense of decency be lost completely.

In the colliery and mining districts especially we see the operation of these circumstances. The collier, in the majority of cases, comes from his work in the afternoon, and jumps into his tub in the common, and very often the only, living room, in the midst of an unabashed family circle. The northern miner visits the sea side, bathes promiscuously with his family and friends in the sea at a distance from his machine, and walks, in a state of nudity, through a file of admiring acquaintances of both sexes, to regain his clothing, without fear and without reproach. This does not indicate a satisfactory state of mind as respects morality and the sense of decency, and we know that moral declension involves a by no means satisfactory mental condition, but greatly the reverse.

It is much to be feared that the communism which prevails far too largely in the domestic life of the lower classes, has led, in great measure, to the slight estimation in which are now held a falling away from virtue, and what are commonly known as the "misfortunes" of females of the lower class, to which so many cases of insanity owe their immediate origin. As the Commissioners in Lunacy for Scotland observe, when commenting upon the crowded and indecent state of the houses of the lower class Scotch, "The more these details are considered, the more hopeless will appear the task of remedying the evils which they shadow forth, until

measures are adopted for raising the character of the masses, and training them to higher aspirations."

The difficulties of such a task can, by no means, be over-rated; but it is of so much importance that it demands to be attempted.

Decent dwellings should be provided for the labouring classes in numbers, and with accommodation, sufficient for the requirements of decency and comfort; if necessary, even at the primary charge of the State; and there should be some efficient safeguard against the overcrowding which is insanitary and indecent, by some extension of the Lodging House Act, or otherwise. I cannot but think, too, that the employment of wives and mothers in factories should be absolutely forbidden; and that some attempt should be made to give a sounder moral training to the children in our schools; to attend more to their physical development; and to teach them the principles which regulate, and the means by which they may maintain, mental and physical health. As has been wisely said,* "There are times when we are *diverted* out of errors, but could not be *preached* out of them;" and I believe that, by acting upon the principle which is here embodied, we should accomplish a great fact in the amelioration of the working classes, who now have the requisite leisure, and only require to be helped to use it profitably, if we could succeed, as by united action we undoubtedly could, in reducing the number, and improving the quality, of public houses, and in substituting for them healthy and harmless amusements. A bright, cheerful building in each town, with objects of interest around its walls, and musical or other regular entertainments, on the plan of our local Exhibitions, or of the Bethnal Green Museum, would do much to civilize the masses and keep them from those vicious sources of gratification which so often end disastrously in pauperism, crime, and insanity.

And it must be remembered that the mere present is not that alone to which we have to look. Defects thus acquired do not usually end with the individual, but descend from one generation to another, assuming constantly new and varied forms. The extent to which insanity is hereditary is still a matter of speculation, although no doubt exists that it is so in a very considerable degree. Statistics give variable proportions, from one-tenth to nine-tenths, and it may probably be put midway between those extremes. I have traced it in thirty-two per cent. of the total admissions into

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* Stephen Montague.

the York Asylum during the last twenty-seven years; and M. Behic found it in 530 out of 1,000 insane persons in France whose histories he carefully traced. It no doubt exists to a much larger extent than any mere statistics can show, (1) because, its existence is in a large number of instances, either concealed or ignored by those who give the histories of patients; and (2) because in following the law of heredity, it frequently overleaps one generation, to re-appear, under one or other of its varied forms, in the second or third. It is a great mistake to suppose that hereditary predisposition to insanity always shows itself in the descent of fully developed insanity from parent to child. Habitual intemperance, or the disposition to it; slight peculiarity or eccentricity; graver moral or intellectual obliquity, may be its only signs, or even these may be absent, and yet in the next generation the original form of nervous defect may reappear in more than its pristine intensity.

"It might seem, at first sight, that this presence or predominance of the constitutional defect implied a kind of fatality in the course of things, which it would be useless to attempt to resist. That there may be, occasionally, some ground for this idea it would be wrong to deny; but, in a large proportion of cases, the morbid element is not so potent as to be entirely beyond control. The peril being understood, it may be kept in abeyance by avoiding all those incidents and influences which are calculated to bring it into active operation, and by faithfully complying with the proper rules of living."* In this way a knowledge in the individual of inherited predisposition to insanity may, and ought, materially to influence his course of procedure and mode of life. "Beyond the mere tendency to disease, all the rest is, very often, a matter of accident. Not the necessities of the constitution, but circumstances, determine whether the tendency remains in abeyance, or is converted into overt disease."* And, therefore, sound mental discipline, the habitual exercise of mental hygiene, and the employment of self control in the repression of unhealthy manifestations or habits of thought, combined with attention to physical health, may secure the individual against any active development of insanity.

Congenital disposition to insanity is more frequent where marriages of consanguinity take place, and decreases by intermixture with strange blood. As Griesinger points out, "The first circumstance is very evident among the aristocracy of certain countries;

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* *Contributions to Mental Pathology*, by J. Ray, M.D.

also in the Jewish population; and it is especially striking among the English Quakers." He might also have added, and among the inhabitants of some of the more confined Swiss and Italian valleys, where intermarriage prevails to so large an extent.

My friend, Dr. Kitching, of the Retreat, at York, in his report for 1872, has discussed this circumstance in connection with the Society of Friends; and as his remarks are epecially interesting, I will give them in full. He says, "Not infrequently surprise is expressed by those not conversant with insanity, that, seeing 'Friends' as a body are so orderly and regular in their lives, and that instances of intemperance in drinking are comparatively rare, there should still be so large an amount of insanity within our borders; and the question is often asked, To what can this be owing?

"The enquiry is an important and interesting one. The fact of a large amount of insanity existing in a body of persons among whom intemperance is almost unknown, only shows that there are other causes perhaps as potent in the causation of insanity as indulgence in alcohol. The extensive pervasion of hereditary predisposition in our body forms a powerful element in aid of any exciting cause, which may come from without, or arise from within. This hereditary predisposition may be taken as an established fact. It is possibly now undergoing a diluting process, by the adoption of a more liberal policy by the Society in regard to marriage with those not in membership with us.

"Physically, at least, the widening of the portals for the entrance of new and vigorous life into our precincts must be a boon of great worth; and with the influx of a healthier physical life, will come also, in a measure at least, a simultaneous increase of mental soundness and vigour. The exclusive discipline which prevailed in our Church on this subject till about fifteen years ago, must have restricted marriage not in area only, but in numbers also.

"It is difficult to say which restriction is most prejudicial in its effects; the true expression of the difference probably is that a restriction in number is more hurtful to the present, and a restriction in area, to the next generation. If this conclusion be correct, it affords a key to some part of the solution required, and we may now be reaping the fruits, in a degeneration of vital and cerebral power, of the narrow and mistaken policy adopted by our predecessors for religious ends."

In the interests of the Society of Friends, the change of policy

specified in the foregoing statement is much to be commended, for it is a well established fact, that the evils which result from intermarriage have a tendency to effect their own cure by the gradual but ultimate extinction of the family or race, and it would, no doubt, materially improve the mental and physical prospects of the race if the marriage of blood relations were altogether prohibited by law.

It is certainly to be desired also that greater circumspection were exercised in the marriage of persons who have been insane or are strongly predisposed to it. Insanity in the past or present should, I think, be made a legal obstacle to the marriage, at all events of the individual, in spite of the theory of Moreau and Dr. Maudsley that the children of insane parents are generally gifted with great genius, and that to stop their production would be to deprive the world of some of its brightest ornaments, and the pioneers of its highest progress.

We have probably scarcely yet attained that period in the world's history at which we shall be prevailed upon to resort to that attempted revival of the laws of Lycurgus, which has been so strongly urged by the author of "Euthanasia." Rather should we emulate the condition which Macaulay describes as prevailing in Rome,

> "Then none was for a party;
> "Then all were for the state;
> "Then the great man helped the poor,
> "And the poor man loved the great:"

for the whole question which we have been discussing is no less of general than of personal importance. It more or less affects every individual, and it exercises an influence over the national life. Public and private effort, therefore, require alike to be put forth, if the progress of insanity is to be stayed, and its influence weakened. In the words of Mr. Bright, when speaking of a kindred subject, "It is by the combination of a wise government and a virtuous people, and not otherwise, that we may hope to make some steps to that blessed time when there shall be 'no complaining in our streets,' and 'when our garners may be full, affording all manner of store.'"

Thus, and thus only, shall we succeed in regulating and diminishing the influence of Insanity in relation to Society.

NOTES ON THE RECENT PROGRESS OF PHYSIOLOGY.

By B. T. Lowne, F.R.C.S.,
Lecturer on Physiology at the Middlesex Hospital Medical School.

The science of physiology has made such rapid and remarkable strides in the past few years, that a brief *resumé* of some of the more important additions which have been made to our knowledge cannot fail to be acceptable, more especially to those who, from an active professional life, are debarred from following the progress of physiology in all its detail. With this object those facts and views which have a practical bearing will be more especially considered in the following pages, although others, the practical application of which is unknown, or which have possibly no practical interest, will, from their extreme importance, also demand attention.

Commencing with the blood, the most notable additions to our knowledge are, as far as can at present be determined, but of slight practical importance to the physician. The general recognition of the amœboid or proteiform condition of the living white blood corpuscle, first observed by Wharton Jones, as early as 1846, holds perhaps the first place by virtue of its importance, especially when coupled with Cohnheim's observations, made in 1867, showing their capability of passing through the unruptured walls of living vessels. The rapid increase of this tendency during inflammation or congestion has been distinctly made out, although it must be confessed no certainty has been arrived at with regard to the origin of pus corpuscles. However probable Cohnheim's view may appear, that they are merely altered white blood cells, Virchow's rival theory, that they originate by the multiplication of epithelial or connective tissue corpuscles, has many adherents.

The protoplasmic nature of connective tissue corpuscles, and the rapid appearance of migratory stellate cells in the cornea, during inflammatory action, have given rise to the belief held by many that

these are also merely metamorphosed white blood cells. At present at least, however, this view is incapable of proof, and may therefore be fairly dismissed from our consideration.

An exceedingly interesting fact concerning the white blood cells is their capability of burying solid particles in their substance; when living they may be fed with carmine, milk granules, &c., which they include in their interior just as the lowest forms of animal life enclose their food. Mucus corpuscles differ in no important particular from white blood cells, and perform an important function in the air passages by imbedding foreign matter in their substance, and thus rendering it harmless.

The increase of our knowledge concerning the structure of the red corpuscles of the blood is scarcely less important. De Chaumont discovered in 1851 that the blood disc consists of two elements by observing the effect of the vapour of chloroform upon it; whilst the observations of Rollett, and others, have rendered it certain that the blood disc consists of a stroma, called the œcode, and of protoplasm, the sarcode. The relation of these parts may be compared to a sponge soaked in jelly, in which the sponge would represent the stroma, and the jelly the sarcode. The latter contains the iron compound of the blood. Movements have been observed in the living red corpuscle, by which its margin becomes dentated.

The nature of fibrine has been accurately determined, and it is now known to originate by chemical change in the blood plasma, due to the union of two nearly related albuminous principles, paraglobulin and fibrinogen, substances first described and isolated by Schmidt, in 1862.

Coagulation in the living vessels seems to be due to the catalytic action of proliferating endothelial cells, and hence the necessity of rupturing the internal coat of an artery by its ligature, no clot being formed in a vessel which is simply occluded, unless its endothelial lining is injured.

The application of spectral analysis to the blood, as well as to other organic fluids, has thrown much light on their chemical nature, and will probably be the source of much valuable information in the hands of future observers.

The investigation of the phenomena of the circulation has been carried on with great vigour both in this country and in Germany, where the invention of more accurate modes of research by Ludwig, by the adaption of a contrivance of Watts, used by him for

registering the pressure of the steam engine, to the more delicate purposes of physiology, in the form of the kymograph, inaugurated a new era of research. By means of various modifications of the kymograph, in the adaptation to it of Poisseuille's Hæmodynamometer, and Marey's Sphygmograph, graphic tracings of the movements of the heart and vessels have been obtained by numerous and accurate observers; and by this means vast numbers of delicate experiments have been carried out, on the heart and vessels of both frogs and mammals.

The introduction of physiological laboratories, too long delayed, has added not a little to the advance of science in this country, and thus many facts, which were only known by a few, have been confirmed and seen by multitudes of students.

In giving an account of the phenomena of the circulation, only the main points will be touched upon in this report, and the reader is referred for fuller information to the *Handbook for the Physiological Laboratory* recently produced from the joint pens of Drs. Brunton, Foster, Klein, and Sanderson.

Physical experiments have shown that the pulse wave recorded by the sphygmograph, applied to the arterial pulse, consists of two distinct impulses, called by Dr. Sanderson the percussion and expansion waves. The percussion wave may be produced in a closed elastic tube containing fluid, by a single stroke with a hammer; the expansion wave is formed alone when fluid is pumped through an elastic tube, by the pressure of the hand upon an ordinary elastic syringe. Each of these waves produces a different tracing with the sphygmograph, and these are combined in the natural arterial pulse. The percussion wave in the pulse is due to the suddenness of the ventricular contraction, and the normal pulse wave has been successfully imitated artificially by Dr. Sanderson in an elastic india-rubber tube, by the adaptation of a simple hydrostatic contrivance which resembles the heart in the suddenness of its action.

These facts probably explain the nature of the dichrotic pulse. In the normal pulse the expansion wave occurs almost synchronously with the percussion wave, and masks it. When the arteries want tone the expansion wave is delayed, and the percussion wave becomes prominent. Another explanation of the dichrotic pulse is however offered by Dr. Sanderson, who refers it to a recurrent wave due to the resistance in the flow of blood through the capillaries.

The existence of an intracranial vasomotor centre in front of the medulla, and behind the corpora quadrigemina, in the rabbit, has

been distinctly proved experimentally by Ludwig and Owsjannikow. It has been shown that this centre is in constant automatic action to keep up the arterial tone, and there is good reason to believe that its constant automatic activity is maintained by its relation with the sensory and splanchnic nerves, which apparently contain certain afferent fibres in reflex relation with the vasomotor nerves. Section of the cord below the vasomotor centre produces general relaxation of the arteries, which is counteracted by stimulation of the cord. Indirect stimulation of the vasomotor centres, through the peripheral sensory nerves, or through the splanchnic nerves, increases the vasomotor activity. Contraction of the vessels produced by stimulation of sensory nerves is general, except in those parts to which the stimulus is applied, where the arteries dilate. In this manner the action of a mustard plaster on the general circulation and viscera is explained, local dilatation of the arteries and capillaries is accompanied by general contraction in other parts of the body. It has also been shown by experiment that contraction of the arteries gives rise to increased resistance, and renders the action of the heart slower, although the exact manner in which it does so is not certain.

A small nerve exists in the rabbit, uniting the pneumogastric nerve with the inferior cervical ganglion, which is called the Depressor nerve, a name bestowed on it by Cyon and Ludwig, who first investigated its function. It is an afferent nerve, and it has been experimentally shown, that, after its division, stimulation of its central portion gives rise to an immediate fall of the arterial pressure and corresponding dilatation of the vessels. It is thus a direct antagonist of the vasomotor nerves, acting centripetally upon their centre. Its functions and uses are unknown, although it is probably connected with the heart through the inferior cervical ganglion, and serves in some way to correlate the heart's action and the arterial pressure.

The intrinsic ganglia of the frog's heart have been satisfactorily demonstrated, and shown to be the cause of its rhythmic action. Isolated muscle fibres, with ganglionic cells attached, have been seen with the microscope pulsating rhythmically, whilst fibres without any ganglion cells do not contract.

The inhibitory action of the pneumogastric nerves upon the heart's action, first observed by Weber, in 1846, has been entirely confirmed by numerous observers, and Czermak has produced the usual effects of irritation of the vagus in his own person by carefully

applied pressure over the nerve in his neck. It has been further shown that the inhibitory action of the pneumogastric is constant, and, like that of the great vasomotor system, depends on the constant action of certain centripetal fibres; these belong to the sympathetic system, and are in reflex relation with the pneumogastric through a centre in the medulla. Bernstein, moreover, has demonstrated that irritation of the great splanchnic nerves acts upon the heart in this manner: thus accounting for the sudden death, from failure of the heart's action, which so frequently results from injuries to the abdominal viscera.

The discovery of the accelerator nerves of the heart by Bezold has been confirmed by numerous observers, although the existence of an accelerator centre in the medulla or cord has not been proved. The action of these nerves is known, however, not to be constant like that of the vasomotor and inhibitory nerves. The accelerator nerves are connected with the spinal cord, and pass through the inferior cervical ganglion.

The minute anatomy of the lymphatic system has been carefully worked out by Recklinghausen and others, and the interstitial termination of the lymphatics in tissue spaces has been clearly demonstrated, so that the lymphatics may be looked upon as the drains by which the plasma effused or secreted from the blood by the tissue cells is returned to the blood. Moreover, the great pleural and peritoneal sacs have been shown to communicate directly with the lymphatics, which are connected with them by open mouths or stomata. This important fact, first discovered by Recklinghausen, has been verified by Klein and numerous observers.

These facts are of considerable morphological interest, when we remember that the pleural and peritoneal sacs, as well as the lymph spaces in the tissues, are really splits in the middle layer of the blastoderm, or formative membrane of the embryo, and that they correspond to the so-called blood sinuses of most invertebrates.

These splendid results have been chiefly attained by improved methods of research, especially by the process of staining preparations with nitrate of silver solution.

The respiratory function has been studied with great care, but except in its relation to the circulating and nervous systems, nothing very material has been brought to light. Perhaps the most important physical fact added to our knowledge is the existence of a minus pressure, when compared with the ordinary atmospheric pressure, in the mediastinal and pleural cavities, due to the elasticity

of the lung. This has probably a considerable accelerating power over the venous circulation.

Dr. Burdon Sanderson has shown by careful experiments, that the rhythm of the heart is subject to a periodic variation, which corresponds to the respiratory periods, but is not dependent on them ; since during artificial respiration, the rhythm of which does not correspond to the normal respiratory rhythm, the periods of variation in the heart's action remain unaltered.

The function of the pneumogastric nerve, as well as that of the superior laryngeal, has been carefully studied. It is now well known that the pneumogastric is an afferent respiratory nerve, and that after the section of both vagi in the neck of the rabbit, the number of respirations falls from one hundred and forty to fifty per minute, or fewer, but the number can be often restored by the careful application of an exactly adapted induced current to the extremity of the central portion of one of the divided nerves.

After section of both pneumogastrics all the symptoms of dyspnœa present themselves, and although the slow inspirations that follow are proportionately deep, the blood becomes venous, a phenomenon the explanation of which is unknown. At the same time, the mucous membrane of the larynx and trachea loses its sensitiveness, and the muscular tissue of these organs becomes paralyzed ; hence when foreign bodies, as dust, enter the air passages, and mucus collects, these are not expelled by coughing, and inflammation of the lungs results.

The superior laryngeal nerve possesses the remarkable property of inhibiting the inspiratory act when its peripheral fibres are irritated, thus forming a safeguard to the trachea, preventing the inhalation of certain irritant gases, &c.

The additions to our knowledge concerning the chemistry of the digestive processes are very numerous, owing to the more accurate chemical processes employed in this branch of research. The most important of these is the formation of peptones in the stomach, by the action of the pepsine and hydrochloric acid of the gastric juice on the albuminous principles of the food. Whilst albumen is incapable of passing through an animal membrane, or nearly so, peptones pass with great ease ; hence the easy passage of albuminous matters into the blood. It is now known that pepsine is powerless to dissolve albumen, except in the presence of free acid, although in its presence it dissolves both living and dead tissues. The non-solution of the stomach during life is admitted to

depend entirely on the presence of abundant alkaline blood in its mucous coat—a view long since held by Dr. Pavy—and to the fact that the acid of the gastric juice is only found on the surface of the mucous membrane so long as the fluid remaining in the secreting follicles is either alkaline or neutral.

The exact function of the gastric fibres of the vagus is still unknown, but it is probable that they consist of both afferent and efferent fibres. When the mucous membrane is gently irritated, as by food or the introduction of a feather, gastric juice is secreted in abundance; but violent irritation checks all secretion, and often causes vomiting. The stomach becomes red when the afferent fibres of the pneumogastric are gently irritated, showing inhibitory action on the vasomotor centre.

The digestion of albuminous substances by the pancreatic juice, first discovered by Bernard, has been confirmed; so that the pancreas digests not only starches and oils, but fibrine and albumen. The absorption of minute solid particles by the lymphatics of the villi has been clearly demonstrated.

The structure of the liver may be said to have been fairly made out: at least, most observers admit that the liver cells are first formed in acini of the bile duct, (Beale's view,) and that an ultimate plexus of spaces without special walls exists between the cells, formed by grooves in the contiguous surfaces of adjacent cells, by which the bile finds its way into the plexus of the bile ducts, outside the lobules. This mode of termination of the bile tubes was first observed by Herring, and the view has been adopted by Kölliker and Klein.

But little has been added to our knowledge of the functions of the liver since Bernard discovered its glycogenic function in 1848. If, as Cyon thinks, urea is formed in the liver, we can readily understand that nitrogenous food is split up in this gland, to form urea and glycogen, but there is still some doubt upon the subject. Glycogen seems to perform some very important functions in relation to cell growth; this is inferred from its abundance in rapidly growing and young tissues. Hoppe-Seyler has shown that it exists in living white corpuscles, but that it is converted into sugar at the time their power of motion ceases. Nevertheless, experiments seem to demonstrate conclusively, that sugar is formed in the hepatic vein during life, by the action of a ferment which is also formed in the liver.

The origin of the bile still needs careful investigation. It seems probable that its colouring matter bears some relation to that of

the blood and urine; this much is certain, the bile is secreted at a low pressure when compared with saliva or milk, and is readily reabsorbed when either the blood pressure is diminished or obstruction occurs in the ducts increasing the pressure of the bile. There can also be but little doubt that the bile is reabsorbed from the intestine in part at least, and again separated from the blood by the liver. It has been experimentally demonstrated that mercury has no direct effect upon the secretion of the biliary fluid, and Dr. Brunton's view with regard to the action of the drug deserves very careful consideration. He believes that it diminishes the quantity of bile by rapidly removing it from the duodenum and small intestine, and thus preventing its reabsorption.

The main function of the bile is probably physical, as it can be demonstrated that oil passes readily through a filter moistened with bile, although it is incapable of passing through one moistened with water.

The excretion of cholestrine from the blood is also an important function of the liver. Suppression of the excretion is followed by cholestræmia, leading to death by coma.

Schiff has pointed out a probable function for the cæcum, but confirmatory experiments are wanting. He believes that ferments, "peptogenic substances," are prepared in this organ from the digested food material, that these are absorbed into the blood, and excreted by the pepsine cells of the gastric walls. If this be so, we have a striking analogy between gastric digestion and ordinary fermentation, where the ferment increases *pari passu* with its product, and is used again to set up fresh fermentation; as in brewing beer, where yeast from fermenting beer is used to start the process in a fresh wort. Meisner speaks of a similar relation between the stomach and the pancreas.*

The excretion of urine, like that of the bile, is augmented by increased blood pressure, and diminished by the opposite condition, at least so far as its water is concerned: it does not appear, however, to be reabsorbed by reduced blood pressure; perhaps from the rapid manner in which it is discharged from the kidneys.

According to Heynsius, the exudation of albumen from the Malpighian tufts is prevented by the presence of an acid in the gland, and by the acid reaction of the urine. Albumen passes

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* Carpenter's *Human Physiology*, 1861, p. 144.

through membranes with great difficulty in the presence of a neutral fluid, and scarcely at all in that of one with an acid reaction.

The researches of Voit, Edward Smith, Fick and Wislicenus, Haughton and Parks, on the excretion of urea, have, in the last ten years, revolutionised our views as to the origin of muscular force. It was formerly regarded as an aphorism that the tissues, and especially muscular tissues, became oxidized during the performance of their function. If this were so, the quantity of muscle oxidized should be proportionate to the work done, and the amount of nitrogen excreted by the kidneys would correspond to the weight of muscle oxidized; the excretion of urea increasing *pari passu* with the destruction of nitrogenous tissue. Careful and numerous experiments, however, have demonstrated that the quantity of nitrogen excreted does not correspond to the amount of work done, but to the amount of nitrogenous food ingested. Indeed when nitrogenous food is supplied it is found that the quantity of urea excreted actually diminishes during active exercise, and that after, not during, exercise, a slight increase of excreted nitrogen can be detected. The conclusions which follow from the experiments of Haughton and Parks are, that, whatever the source of muscular force may be, it is not derived from the oxidization of muscular tissue; that the muscles are more actively nourished during work; and that they return to their normal condition during rest. There is no doubt, however, that chemical changes take place in the muscular tissue during contraction, since a muscle which was neutral before, becomes distinctly acid during activity. Indeed the blood of a tetanized frog becomes after a time neutral, or even decidedly acid.

The whole question of the exact mode in which force is generated in the living organism is yet a profound mystery. We know with certainty only, that it is the product of oxidization, and that it exactly corresponds with the force which could be produced with the same material artificially. That is, the amount of heat and other force generated is exactly equivalent to the heat equivalent of the substances oxidized. It is probable that heat is formed in the tissues as well as in the blood, for Bischoff, G. v. Liebig, Bernard, and Ludwig, have shown that the temperature of the great glands is higher than that of the blood, whilst the temperature of the blood itself varies in different parts of the body. It still remains uncertain, however, whether the temperature of venous or arterial blood is higher, some observers having found that in the right side, and others that in the left side, of the heart to be higher by one or two

degrees Fahrenheit; nor is this to be wondered at, seeing that the amount of heat lost in the lungs depends on the temperature and dryness of the atmosphere. Dr. Gamgee, has shown by the most careful experiments, that the oxidization of even large quantities of reduced hæmoglobin is attended by a very slight rise of temperature only. As a large equivalent of heat is needed to raise the temperature of the inspired air in cold climates, which cannot result from the cooling of the blood, which is at most very slight, this heat must be attributed to the oxidization of glycogen, sugar, or other blood extractives in the capillaries of the lungs. Indeed, we may infer that the oxidization of extractives probably takes place in every part of the body.

Various theories have been invented to account for the origin of muscular force, but all are more or less unsatisfactory. Some ascribe it to the nervous centres, and others to the blood. Against the first view, it must be remembered that muscle contracts when completely separated from the central nervous system, and that it exhibits an electrical condition, closely related to, if not identical with, that of the nerves themselves. Against the latter view, even Ranke, one of its advocates, states that muscle will contract for a very short space of time, even when entirely freed from blood.

The structure of the muscle fibre has been made the subject of repeated and laborious research. This much is quite certain, that all muscle consists of two kinds of material: a matrix, which is not a double refractor, with numerous minute doubly refracting particles, called *disdiaclasts* by Brücke, imbedded in it. The disdiaclasts of non-striated muscle are arranged in longitudinal and striated muscle in transverse rows. The contraction of muscle, according to Brücke, is accompanied by a rearrangement of the doubly refracting particles. The muscular fibres of the heart are composed of oblong nucleated cells, and a similar division of ordinary striated muscle by septa, dividing the tube of the myolema, and continuous with the myolema, has been observed in insects. The septa are readily demonstrated in the fresh fibres of the heart by staining with silver nitrate. The termination of the nerves in end-plates upon the myolema appears to be the most constant mode of termination in voluntary muscle, in non-striated muscle the ultimate nerve fibres have been traced to the nuclei.

The central nervous system still remains but little understood, although numerous experiments have been performed and much careful investigation has been bestowed on the subject. Perhaps the

most important contribution to our knowledge is Dr. Ferrier's paper, in the West Riding Hospital Reports, on the functions of the cerebral convolutions. Even the ultimate central terminations of the nerves remain unknown. Their peripheral terminations have afforded, however, some of the most brilliant results of modern microscopic research. The discovery of the termination of nerve fibres in the nuclei and walls of secreting, muscle, and epithelial cells must be reckoned amongst these. Donders first traced the branching of individual nerve fibres in the salivary glands of the horse, Krause followed them into the alveoli, and Pflüger demonstrated their passage through the membrana propria of the gland, and their terminations in the cell walls and nuclei. This discovery of the organic connection between nerve fibres and excreting and secreting cells, has necessitated a modification of the view that a cell is disintegrated or bursts to discharge its excretion. The probability of this view is no longer tenable.

Great strides have been made in our knowledge of the structure and physiology of the sensory organs, a fact sufficiently shown by the classic works of Donders and Helmholtz. No branch of physiological science has been investigated with greater results than the structure of the eye and ear, and the action of sound and light upon their nerve terminations, although the first principles of the theory of sight and hearing must be ascribed to Müller.

The relation of these special senses to touch is now distinctly recognised. All our knowledge of external objects derived from touch is due to the impact of substances upon the peripheral nerve terminations of centripetal nerves, the effect of vibrations upon these or similar nerve terminations giving rise to the sensation of warmth or cold. There is reason to believe, both from analogy and pathological facts, that the perception of warmth is the function of certain undiscovered but specialised peripheral nerve terminations, and possibly of a distinct nerve centre.

The exact relation of the gustatory and glosso-pharyngeal nerves to the sense of taste still remains doubtful, but the discovery of special organs of taste, called by their discoverers, Loven and Schwalbe, gustatory bulbs, as terminations of the glosso-pharyngeal nerves, is of the highest importance. These bulbs consist of collections of peculiar fusiform cells, in the nuclei of which the nerves terminate. The cells of the gustatory bulbs are very similar to the special olfactory cells of the nasal mucous membrane.

The terminations of the auditory nerve have been studied with

the greatest care and patience, and their complexity is so great that nothing short of the study of a special treatise can convey any adequate idea of the structure of the internal ear to the mind. The otoliths which were formerly believed to convey the vibrations into immediate contact with the nerve endings, are now considered in the light of dampers, a view due to Helmholtz, and one which appears exceedingly probable. Helmholtz also believes that the outer pillars of Corti may be regarded in the light of strings (*saiten*), each supported by an inner pillar, which he calls a bridge (*steg*). The vibrations of the basilar membrane, which is in immediate connection with the fibres of Corti, are transferred to these organs, or rather to such of them as are capable of vibrating in unison with each particular vibration. According to Kölliker, there are three thousand inner pillars of different lengths, and E. H. Weber asserts that a skilful musician can distinguish one sixty-fourth part of a half tone. According to the calculation of Helmholtz, thirty-three and one-third of Corti's fibres lie in the range of each half tone, and he believes that when an intermediate sound occurs we perceive the vibrations of two rods instead of those of a single rod; that these are only half as intense as in the case of a note in unison with any given rod, but nevertheless give us an equal sensation, as there are two nerve terminations affected instead of one. The nerves terminate in very minute processes, ear hairs (*hörhaare*), which in the cochlea are in immediate connection (Helmholtz) with the outer pillars of Corti, with which they vibrate. These views are in accord with observations made by Hersen, and others, on the ear apparatus of crustacea and insects. Hersen has seen different hairs vibrate to different notes, in the external organs of hearing of certain crustacea.

The exact nature of the function of the semi-circular canals is yet very doubtful. That they enable us to perceive the direction of sounds still appears probable. But Goltz thinks they are connected with the power of balancing the body; this is seen when they are destroyed in animals, all the movements of which then become so irregular that they are unable to stand or run.

The nerve terminations in the retina, the rods and cones of Jacobson's membrane, are probably differentiated in a somewhat similar manner to the nerve terminations and rods of Corti. According to Helmholtz there are most probably three distinct sets of nerve terminations capable of receiving vibrations of different length, and corresponding to the red, yellow, and violet rays of light. The

periphery of the retina wants the red-receiving organs, and is hence red-blind. Red colour blindness in varying degrees is due to the increase of this peripheral zone, or rather to decrease in the number of red light receiving elements. Three sets of rods have actually been described in birds, rods containing a red, rods containing a yellow oil globule, and a third set wanting any such appendage; it seems probable that these correspond in their vibrations with the three primary colours.

In embryology numerous additions have been made to our knowledge. The most important, perhaps, of these was the discovery of the inflection of the blastoderm upon itself, showing a continuity between the inner and outer layer of the blastoderm in amphioxus, by Kowalewsky, and in the egg of the frog, by Rusconi. This inflection has not yet been observed, however, in birds or in mammals.

The question of spontaneous generation remains much in the position it assumed years ago, except that it seems certain that some of the lower organisms under peculiar conditions bear a much higher temperature than was formerly supposed to be compatible with life. No very remarkable results have accrued from numerous experiments; all that can be said is, that the great weight of evidence is still in favour of the old aphorism: *Omne vivum ex ovo.*

The theory of natural selection, better known as Darwin's law, has undoubtedly led to very careful and good work amongst naturalists, and is accepted, in great part at least, as certain by many good and accurate observers, as well as cautious men. It is perhaps to be regretted that it has not been adopted as a guide to research by some able and careful physiologists and pathologists, as it seems to the author, that it is a doctrine which will ultimately prevail, and throw great light on both the morbid and healthy phenomena of life.

AN ENQUIRY INTO THE VALUE OF THE SIGNS AND SYMPTOMS REGARDED AS DIAGNOSTIC OF CONGENITAL SYPHILIS IN THE INFANT.

By Thomas Ballard, M.D.,

A Vice-President of the Association.

We are all accustomed to hear much about Congenital Syphilis, its fatal effects and prejudicial influence upon our race. The prevalence of it has been much insisted on lately. Sir W. Jenner, in his evidence before the Parliamentary Committee, says "Congenital syphilis is exceedingly prevalent, and leads to a large number of deaths annually." Mr. Curgenven, in a paper "On the waste of Infant Life," says "Syphilis, as an hereditary disease destroying infant life, appears to be on the increase; in fact this disease has universally increased in this country of late years;" and in support of this statement he quotes the following statistics. "The deaths of children from hereditary syphilis, during the year 1864, under the age of one year, were 1,089; and under five years of age, 1,191. In 1850 the total number of deaths from syphilis was 554, or 31 to one million persons living; and in 1864, the total was 1,550, or 75 to one million persons living. In the parish of Marylebone it has been found that four per cent. of the deaths of illegitimate children occurred from syphilis." Hospitals and dispensaries record that infants suffering with this malady are treated there by hundreds, and individual practitioners avow their familiarity with it.

Doubtless it appears strange for me to differ from this general testimony, but my experience compels me to do so, and justifies me in asserting that the subject is involved in much error. I have practised my profession in the same neighbourhood for thirty years, and I have been accustomed to keep a record of the particulars of the ailments of those whom I have attended. I possess therefore a sort of medical history of a

large number of persons. Many have been born, have grown up, and are still under my observation. Many of these have had syphilis, and in them I have watched and recorded its effects, but have entirely failed to trace any evidence of its transmission to offspring. Fifteen years ago I was earnestly engaged in tracing some of the causes of the ailments of infants, and my attention was particularly attracted to this subject. Since then I have embraced every opportunity of observing and investigating it: I have solicited my medical friends to show me cases of congenital syphilis, and have visited public institutions for the purpose of seeing them. Thus I have had opportunities of seeing and investigating many cases which have been pronounced typical. I have followed many of these to their homes, examined the parents, enquired into their history, and subsequently watched the progress of the infant. In no case have I found any reason to attribute the disorder to inherited disease; the symptoms which were regarded as manifestations of syphilis being satisfactorily accounted for by the conditions attending the child, and easily cured when their true cause was recognised.

The literature of the subject shows that although the idea of the transmission of syphilis to the offspring is of older date, yet it has been chiefly during the present century that a special set of symptoms have been identified as manifestations of its occurrence, and this has been for the most part the work of French physicians. Their conclusions have been accepted by British authors, and they now constitute the doctrine which is held and taught amongst us.

There are three periods during the growth of a child when certain special phenomena are supposed to indicate that the syphilitic poison has been transmitted to it by infected parents:—

(1) Before birth.
(2) At birth.
(3) Some time after birth.

I propose to consider each of these periods separately, and to endeavour to show that the phenomena in question are susceptible of a simpler and more obvious explanation.

BEFORE BIRTH.

It is a well established and undisputed fact that a woman who has been infected by syphilis is apt to abort and have premature deliveries, bringing forth dead children, and that this is the con-

sequence of her contamination. But it has been inferred from this, erroneously as I think, that the fœtus dies in utero in consequence of the direct influence of the virus upon its organism. Trousseau says he is "unacquainted with any lesion of the placenta attributable to syphilis." He considers the cause of syphilitic abortion to be "the death of the fœtus in utero, and this in consequence of syphilis attacking the fœtus itself." I can find no proof of this, and, in the absence of such, it appears to me to be more reasonable to regard the death of the fœtus as the consequence of a failure on the part of the maternal system to sustain its nutrition any longer. We all know by observation how seriously the economy of the mother suffers by the disease, how much of cachexia it causes, how deeply seated, and how persistent are its deleterious effects; no wonder that such an important function as the maintenance of the growth of a new being should be prejudiced by it. The abortion is obviously, as Trousseau says, "merely the expulsion of the dead fœtus"—but why has it died? Is not the defective state of the soil upon which it was growing sufficient to account for it? Some think that the germ may receive the contamination direct from the male parent; if so, why does it grow for many weeks or months, and then die? It seems reasonable to suppose that an inherent poison which is destined to kill a fœtus in three or six months would have exercised its fatal virulence on the more weakly germ long before.

The appearances which are relied upon as evidence of the fœtus itself being affected by the poison of syphilis are, the partial decomposition and the loosening of the cuticle which are often seen on the bodies of still-born children. These are well accounted for by the fact, that, in the majority of instances, the fœtus dies several weeks or months before it is expelled, during which time it is necessarily macerating in the liquor amnii.

A state of putridity has been mentioned by some authors as an additional proof of the contamination of the fœtus, but this involves the attributing to the syphilitic virus of a chemical or septic action, for which I think few would undertake to contend. In cases where putridity has actually been observed, I suggest that it could only be accounted for by the atmosphere having access to the body for some time before it was expelled.

Similar early death and expulsion of the ovum or fœtus occur in those suffering from other forms of cachexia, particularly Bright's disease. I have seen no difference between the appearance of an

aborted ovum or the still-born child of a mother suffering from this cachexia, and that of one born of a syphilitic parent. And so far as I have been able to observe, in either case, when the child was born alive, it had a fair chance of living, and in course of time overtaking in its growth all that it may have lost by reason of its parent's defect.

I submit, therefore, that there is no evidence to prove, nor reason to infer, that the organism of the child is intrinsically affected by the syphilitic virus, the death in utero seeming to be satisfactorily accounted for by some defect in the maternal system, the result of its contamination.

The following cases illustrate this part of my subject.

Case I.—*A wife suffering from syphilis is delivered in the eighth month of a dead child.*

A lady, in March 1861, had been suffering for many months from syphilis communicated to her by her husband at their marriage, and had been under treatment by an eminent physician. On the 13th she was delivered of a still-born child, the epidermis of which was loose and peeled off when touched. This lady suffered from repeated attacks of ulceration of the tonsils and back of pharynx, together with severe periosteal pains, until the end of 1868, since which time she has enjoyed good health, but has not again been pregnant.

Case II.—*Syphilis in both husband and wife; abortions and healthy children.*

In 1852 a young man was under my care for a primary syphilitic sore, he was averse from following much treatment, and subsequently married in 1853. In 1859 he came under treatment for ulceration and abscesses of the scrotum, in 1860 for considerable ulceration and thickening of scrotum, ecthymatous ulcers on arms and body, and scaly eruption on elbows. He was treated with iodide of mercury and bark, and since then has remained well.

His wife came under treatment in June, 1855, for "a hard swelling over tuberosity of tibia, which had been very painful for two months." Catamenia were present on the 8th. On February 2nd, 1856, she was delivered of a small male child, who is still living and in good health. She had catamenial periods in June and July. On October 26th, a profuse discharge occurred, which continued without interruption until December 16th, when labour

pains set in, and an entire ovum passed, containing a fœtus of apparently four months' growth. In October, 1858, she again miscarried. In April, 1860, she gave birth to a living child, who is also still living and in good health.

From March to June, 1861, she was under treatment for a severely painful node on head of right tibia. In December, she again aborted at four months.

In May, 1863, she was again under treatment for a painful tumour just below the right knee, which eventually ulcerated. In June, she had a painful swelling over head of tibia on inner side of left knee. The catamenia were present on February 5th. On August 22nd, she was delivered of twins, one dead, and the other alive, which survived twenty-two hours. On January 16th, 1866, she gave birth to a dead child after a pregnancy of eight months, the skin of which seemed partially decomposed, as it came off in large pieces. In September, 1868, she had an attack of hemiplegia. In February, 1869, she died most suddenly.

Case III. — *Chronic Bright's disease; abortion, premature delivery, &c.*

A lady came under my care in 1862, suffering from chronic Bright's disease in a severe degree. On June 24th, she aborted at the second month. On November 11th, 1863, she was delivered of a child at full term, it was remarkably small, but has survived, and is now strong and healthy. On April 24th, 1865, she was delivered of a small weakly infant, which died on June 21st, in spite of all the efforts which were made to rear it. On June 2nd, 1868, she was delivered of a child at eight months, which was still-born. In 1871, she herself died.

Case IV. — *Syphilis communicated to a wife at marriage; abortions.*

Mrs. E., æt. twenty-two, was married in January, 1870. In March, she was ill with sore throat and severe pains in her limbs. She had advice and was said to be suffering from neuralgic rheumatism. She continued under treatment without benefit until August 16th, when she came under my care. She was then in a very bad state. She was thin and pale, her aspect being that of great suffering, her hair was nearly all off, and it came away with a slight touch. She was very deaf. She had suffered severe pain in her left eye for three months; it was now very painful, much congested, and could not bear the light; she could

scarcely discern anything with it. Her trunk and limbs were covered with a lichenous rash of a dusky colour, giving the skin a muddy appearance. There was such severe pain in her legs and feet that she could obtain no sleep, both legs and feet were much swollen and were very tender. There were small hard tender swellings under the skin of the legs, which I suppose were distended or inflamed lymphatic vessels. She complained of severe pain in the hips. The throat was not very sore, but the tonsils bore the remnants of ulceration. There was a systolic murmur at sternum and left costal cartilage on level with nipple. The urine was pale and clear.

I examined her husband on August 21st. He had an eruption on trunk and thighs, in some places of small bullæ, in others of cicatrices of bullæ surrounded by copper coloured areolæ. He could not open his mouth widely because of stiffness of the articulation of the left side. Has suffered like his wife from severe "rheumatic" pains in shoulders, arms, and knees since February last. At one time the pain was so bad in his shoulder that he could scarcely move it; the pain has always been worse at night. He has a large mass of swollen glands behind the left angle of jaw, which he says has existed a long time. He denies having had any venereal disease, but remembers last autumn having a sore throat on several occasions. He has had no advice or treatment.

They were both advised a hot air bath with half a drachm of calomel each night. On October 14th, Mrs. E. had used twenty-four baths, she was much better, had gained flesh, her hearing and vision were restored, but there remained a little pain in the eye. On November 11th, the eye was quite well, hearing restored, hair did not come off, eruption had disappeared from body, felt well except some pain in shin bones and ankles at night. She had used twelve more baths, in all thirty-six.

December 20th.—She had symptoms of pregnancy, catamenia had not appeared for nine weeks. January 14th, 1871.—She aborted.

October 23rd.—She was quite well in health, and had been pregnant since April 26th. November 20th.—Delivered of an immature fœtus, apparently of about five months' growth, the skin of which was loose.

October 29th, 1872.—She was six months and a half advanced in pregnancy. At 6 p.m., having just come in from a walk, and without any warning whatever, she was suddenly delivered of an entire ovum, containing a fœtus, which was regarded by

an experienced accoucheur to be of between six and seven months' growth. It was dead, and she supposed it had been so a week.

May 14th, 1873.—She was again six months advanced, and felt the child strongly.

On July 27th she was delivered of a still-born, well-grown child. Five weeks previously she had suffered a severe fall; since which she believes the child had been dead, as she had not felt it move.

AT BIRTH.

If the death in utero of the fœtus is really due to the direct effect of the syphilitic virus upon its organism, it is remarkable that "at birth" there should so rarely, if ever, be any manifestations of the disease upon the child. Many authors record their testimony in favour of this statement. M. Huguier has observed but one case at Lourcine. M. Cullerier has never seen one at the same institution. MM. Trousseau and Lasègue have never seen congenital syphilis at the time of birth. Dr. West "has never seen a case in which an infant at birth presented evidence of the venereal taint;" and certainly I never did, though I have on several occasions anxiously looked for it. On the other hand, there are a few cases recorded which seem to bear testimony in favour of such cases having been met with. Notably is the case mentioned by Sir Astley Cooper, and quoted by all writers. He says, "I have seen a child born at full term, whose nates and palms of hands and soles of feet were covered by a genuine syphilitic eruption. I gave the child Hyd. c. cretâ, and it manifested little improvement." It is so unlikely that Sir Astley Cooper practised as an accoucheur that I conclude he records that which he was told, rather than what he actually saw. It is a common occurrence for an infant to acquire an eruption on the nates, &c., in the early days after its birth, and for the parent to speak of it afterwards as having existed at the time of birth. The following case illustrates my meaning.

Case V.—A few weeks ago a medical friend sent me from a public institution an infant ten weeks' old, which he had been treating for three weeks as a case of congenital syphilis. The nates, thighs, and hypogastric region, as high as the navel, were covered by a dense, deep red rash, which was desquamating. The mother insisted that the rash existed at the time of birth, but upon cross examination admitted that she had not seen it until it was ten

days old, and that up to that time the child had been suffering from thrush and diarrhœa. When it was explained to her that the rash was caused by the presence of the wet and soiled napkin, she admitted that in saying it was present at birth she only expressed what she thought, as she was otherwise unable to account for it. A direction to keep the child clean and dry, and a little zinc ointment, sufficed to effect a cure in a week.

I feel therefore that I am justified in mistrusting the testimony in favour of syphilitic manifestations being seen at birth, and in concluding that the weight of evidence is entirely against it, which is a remarkable feature in a disease reputed to be capable of destroying the life of its victim, both before and shortly after birth.

SOME TIME AFTER BIRTH.

All authors concur in saying, that, in the majority of cases, the child who inherits syphilis has at first the appearance of health, and some weeks afterward presents signs which betray the evil transmitted to it from its parents. Usually it is from the first to the third month of extra-uterine life that syphilis is said to manifest itself in the new-born child. Diday has pointed out that the evidence of authorities and that of facts are agreed upon this point. But there is a disorder which occasionally occurs to a new-born infant, within a fortnight of its birth, which has often been attributed to congenital syphilis. I allude to Pemphigus. H. Roger says, "Pemphigus, when it is congenital, is without doubt a symptom of hereditary syphilis. It cannot be mistaken for simple pemphigus, which never breaks out before the sixth, eighth, or even tenth month after birth." The relation of this disorder to syphilis has been much discussed by French authors, and the general conclusion seems to be, that it is a manifestation of hereditary syphilitic contamination, especially so when it is developed on the palms of the hands and the soles of the feet. An excellent drawing of "Pemphigus Neonatorum" is given in M. Cazenove's work. Both hands and feet are covered with bullæ surrounded by a violet areola. It appears to me much more like an erysipelatous affection than one having relation to the other forms of cutaneous disorder, which are considered to be characteristic of infantile syphilis. Dr. Tilbury Fox says, "Pemphigus is of the same nature as erysipelas," and this I believe is the true view to take of it. Respecting infantile erysipelas, Drs. Evanson and Maunsell observe "Inflammation of an erysipelatous nature

sometimes attacks infants, especially those born in Lying-in Hospitals. The disease in its worst form appears about the navel, or lower part of the belly; but it also frequently attacks the limbs, and particularly in the vicinity of joints, as the ankle and wrist. . . . . The erysipelas which attacks the limbs in the first instance is milder in its nature. It often however makes its attacks so speedily after birth, that we have not time to recognise any premonitory signs." In a little work I published twelve years ago,* I wrote a chapter on "The Pyæmic Diseases of New-born Infants," wherein I endeavoured to show that several disorders, including erysipelas, were of that nature, and that the source of infection was an unhealthy suppuration at the umbilicus, which was provoked by the child being exposed to certain unfavorable conditions, which caused diarrhœa and a consequent degree of exhaustion, before the umbilicus was healed, when absorption occurred and erysipelatous symptoms of various degrees of intensity were developed. The following case, which was then published, illustrates this. I may here remark that I can vouch for the absence of syphilis in this case, having attended the family for twenty-five years, and watched the growth of eight other children. It is very probable that many of the cases of the supposed appearance of congenital syphilis, at, or soon after birth, are of this nature, and that the interval between the birth and their first appearance has been forgotten or overlooked. These erysipelatous affections are of course very severe and generally fatal, hence it may be that Trousseau was induced to say that "congenital syphilis is nearly always mortal if it show itself within the first fortnight after birth."

Case VI.—*Erysipelas in a newly born infant, resulting from suppuration at the umbilicus.*

An infant, born on June 20th, 1857, in consequence of improper management, became very ill, and on July 1st, I observe that there is suppuration at the umbilicus, and that the skin of the abdomen, thighs, and vulvæ are in a state of erysipelatous inflammation.

July 2nd.—The vulvæ and nates are swollen, red, and hard. The redness has extended to the neck and down to the ankles, but has subsided on the abdomen; the umbilicus is dry, but not healed.

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* *A New and Rational Explanation of the Diseases of Infants and Mothers.* Churchill, 1861.

Abscesses have formed on dorsum of right hand, and on right foot.

July 3rd.—Abscess on right hand more circumscribed, that on foot diminished. Skin of right leg very red and swollen; dorsum of left foot red, swollen, and doughy; swelling and redness over left sterno-clavicular articulation.

July 4th.—Opened abscess on hand and evacuated a good deal of pus; that on right foot is subsiding. The redness has extended up the side of the face and down the arms to the elbows, where there was much desquamation. The child died early on the 6th.

It does not appear that any one but myself has observed the connection between the imperfect healing and suppuration of the umbilicus and the occurrence of erysipelatous disease. Since I have done so, I have successfully endeavoured to prevent the disorder entirely, and I have not therefore the records of many cases to support my argument; but taking my own experience, together with what I have read, I have arrived at the following conclusion, which I submit for the consideration of those who may meet with opportunities of making further observations on this part of the subject:—That pemphigus and other forms of erysipelatous disease, which may occur within a fortnight after birth, and which have been regarded as syphilitic accidents, are pyæmic affections resulting from an unhealthy suppuration of the umbilicus, which is produced by the child being subjected to certain unfavourable conditions.

I come now to consider those appearances which are generally recognized as indicating congenital syphilis, and which consist for the most part of inflammations of the mucous membranes and skin, declaring themselves at different periods after birth, varying from two or three weeks to three or four months; and also to invite attention to a more simple explanation of their nature, than that they depend upon a lethal virus pervading the child's system which has permitted it to grow and thrive, with every appearance of health, until the parts affected have been for some time exposed to external conditions powerfully able to produce the disorders affecting them. Much stress is laid by the French writers upon the period after birth when congenital syphilis is said to discover itself. Trousseau says, "Syphilis may attack the infant during intra-uterine life, or it may not manifest itself till after birth, in which latter case there are no signs at birth of the disease, the germ of which exists, and will de-

velope itself sooner or later, but rarely before the second week, and it is very exceptional for the disease to make its first appearance after the eighth month, usually it appears about the fourteenth or fifteenth day after birth." M. Henri Roger says, "From a collection of two hundred cases it follows that inherited syphilis discovers itself in nearly one half before the expiration of the first month, and in seven-eighths before the end of the third month after birth. If syphilis breaks out after the third month, the probability is great that the disease is not inherited."

Trousseau says, "Coryza is the earliest symptom of infantile syphilis." Under this term is included inflammatory affections of the conjunctivæ, the Schneiderian membrane, and the lining of the outer ear, to all of which maladies young infants are very liable. Ophthalmia neonatorum, a very common affection, is included by Bertin and other earlier French writers, among the manifestations of congenital syphilis, but I think later observers have limited the imputation of a venereal origin of this malady to its supposed dependence upon gonorrhœa. If it depended, however, either upon an intrinsic disease, or merely the contact of an irritating fluid during the act of birth, why should ophthalmia delay its appearance until five, seven, or ten days after birth? Or why should it appear then? It seems much more reasonable to attribute it to some external cause operating deleteriously upon the delicate eyes. That this is so is easily proved. A newly-born infant if kept with its eyes exposed to the direct rays of light will certainly have ophthalmia; darken the chamber however, and it will recover. If, on the other hand, it be kept in the shade, it will as certainly escape that disease altogether. The delicate Schneiderian membrane of a young infant is obviously more likely to be susceptible of atmospheric influences than that of an adult, it is not then remarkable that it should sometimes become the subject of a catarrh, yet "the snuffles" is considered a very characteristic symptom of infantile syphilis. This apparent anomaly is attempted to be explained by the French recognizing a special coryza, concerning which M. Roger says, "This chronic irritation of the Schneiderian membrane is essentially different from that caused by cold. The latter usually supervenes two or three days after the infant's birth, and coincides with epiphora and bronchitis. Syphilitic coryza at first occasions dryness of the mucous membrane and impedes breathing, a sero-purulent secretion soon follows, sometimes tinged with blood, and containing squamæ

which indicate superficial ulceration." I protest that the above distinctions are not true. Daily experience teaches that an infant may become the subject of "snuffles" at any time when the conditions surrounding it are of a nature to irritate the Schneiderian membrane, and that the severity or duration of the disorder will be entirely regulated by those conditions or the means employed as treatment. Neither is it the fact that the severer form is looked for in the diagnosis of congenital syphilis. The doctrine taught at the present time is, that "snuffles" simply is to be regarded as a characteristic symptom. The following case lately occurred in my own practice, and serves to refute the views expressed by M. Roger.

Case VII.—*Snuffles occurring in an infant a month old.*

On March 19th, 1873, I was summoned to see an infant one month old, the sixth child of a family of position whom I have attended for many years, and in whom I am quite sure there is no taint of syphilis. The child had been quite well until the 16th, when it showed symptoms of what the nurse called "snuffles." The nostrils became partially blocked and discharged thick yellow matter; this continued, and on the 18th a piece of yellow matter of considerable size came down. At my visit the discharge was only watery, but it was evident that respiration through the nostrils was impeded. The child was in all other respects in good health. I directed the nose to be fomented with warm water, and a weak solution of chlorate of potass to be injected. There was no further anxiety about the case, a little bloody discharge appeared occasionally during the next three weeks, and the respiration was somewhat impeded, but by that time the symptoms entirely subsided, and the child has since been quite well.

Cases similar to the above are common enough, and do not demand the supposition of a venereal taint to explain or cure them.

I have occasionally met with otorrhœa in a young infant. In one very severe case lately, a copious thick yellow discharge from both ears persisted for several weeks, but at length yielded to a free syringing daily with a solution of sulphate of zinc. It never occurred to me to attribute this to the child being infected with syphilis; in fact, my knowledge of the family would at once have forbidden the idea. This child has since continued in good health.

The mouth may become the seat of disorder, and much is made

of this in favour of a theory of congenital syphilis. A young infant must feed by sucking, and, being entirely dependent upon its nurse for the source of nourishment, is it surprising if it should make its mouth sore by efforts to satisfy its cravings when difficulties are opposed? The French are accustomed to farm out their children, and it is usual for a nurse to undertake to suckle two or more children. It is no wonder, then, that these children's mouths, and the nurse's nipples, become sore, even to the extent of being torn off. This is the true nature of thrush and other kindred inflammations of the mucous membrane of the mouth. A hard india-rubber teat, or any badly arranged medium for sucking, will cause an infant's mouth to be sore; but attention paid to the cause will at once suggest the remedy. Why, then, should a sore mouth or some soreness of the lips be attributed to a constitutional disease, when there is such an obvious cause operating to produce the malady?

The manifestation most relied upon as diagnostic of congenital syphilis is some form of cutaneous eruption. M. Caillaut says, "The cutaneous phenomena constitute the whole disease in infants; the mucous patch is the true pathognomonic symptom of congenital syphilis of which it constitutes the whole external manifestation." Other writers are more comprehensive in their views of the skin eruptions, and include every form which an inflamed skin can assume, from a simple erythema, to a decided ulceration and a growth from the base of it. The illustration of "Infantile Syphilis" given by Professor Erasmus Wilson in his book of plates is that of an infant eleven months old. "On the outer side of the hips, thighs, and legs, there are broad irregular patches of erythema of a dusky red colour, smooth and polished from slight tumefaction of the derma, and consequent obliteration of the cuticular markings of the skin, having a peculiar metallic lustre and gently raised along the border." The evidence of syphilitic disease in the parents of the child seems to be most meagre. "The mother, aged twenty-six, with the exception of some leucorrhœa and an occasional sore throat, set down by her medical attendant to influenza, since her marriage had enjoyed excellent health, and at time of observation had no symptom of syphilitic disease. Her husband was a vigorous man, who also enjoyed good health; there was no opportunity, as there was no necessity, for going into his previous history." The situation and limitation of the inflammation of the skin points much more forcibly to its being caused by the child reposing on an over warm bed or flannel soaked

with urine, than does the parental history to the child having inherited syphilis.

I have lately seen a case closely resembling this drawing, in which it was quite clear that the condition I have suggested was the real and only cause of the ailment. There is no difference of opinion as to the situation of these characteristic cutaneous inflammations; all concur in fixing them about the buttocks and thighs, ("*les fesses et les cuisses*,") which necessarily include the genitals and anus; and this fact seems, by a strange perversion of reasoning, to weigh heavily in the argument in favour of the malady being venereal, as if it were inferred that because adults communicate venereal disease to each other by contact of the genital organs, therefore the disease must have a natural habitat in those regions, and a disorder appearing on or about the genitals of an infant (obviously innocent of any sexual operations) is likely to be of a venereal nature.

The powerful influence of warmth, moisture, and the contact of woollen materials with a delicate skin, in producing cutaneous disorders of various degrees and forms, seems not to have been appreciated in relation to these cases, but this appears to be sufficient to account for all the phenomena observed. The parts affected are those necessarily exposed to it through the use of napkins and flannel wrappers employed to absorb the urine and fæces; and amongst the poorer classes who are unable to provide linen napkins of ample dimensions, this evil is aggravated by the use of small pieces of calico which are necessarily applied tightly over the buttocks and genitals, and thus by pressure and friction provoke inflammation of the contiguous delicate skin. The distempers established by these means may assume any of the forms of cutaneous disease which are regarded as characteristic of syphilis. This may easily be proved by treating such cases by directing the napkins to be as much as possible dispensed with, and all flannel material to be removed from direct contact with the skin. Any inflammation or ulceration of the skin will then quickly heal if dressed with strips of linen spread with an ointment made with equal parts of lead plaster and zinc ointment melted together. I have never seen a case which did not get well under this plan of treatment.

I invite attention to an excellent photograph of "Syphilis Infantile" in "*Clinique Photographique de l'Hôpital St. Louis*," by MM. Hardy and Montmeja. The nates are inflamed and

excoriated in a severe degree. The skin of the loins, back, and legs is free from eruption. It appears to me that a coarse flannel employed to absorb the child's excretions could alone produce this disorder.

The following cases are illustrations of this.

Case VIII.—S., æt. fifteen months, sent to me on April 1st from a public institution as a case of congenital syphilis; there was an ulceration, the base of which appeared raised above the skin, on the right buttock, extending from the anus, but limited to the part where the opposite buttock touched it. Had been under treatment one year with Hyd. c. cretâ, &c. The mother was a very poor and dirty woman, the child always wore a small dirty napkin, and had had a good deal of diarrhœa. I directed the napkin to be left off; the parts to be kept clean, and dressed with the ointment of lead and zinc above described. On May 1st the ulceration was quite healed. On the 15th only the scar of it was visible; in other respects the child was well.

Case IX.—F. C., æt. three months; first child; parents appeared healthy and denied having had syphilis. Had been treated at a hospital for six weeks for congenital syphilis. On April 22nd the buttocks, thighs, scrotum, and inguinal region were inflamed and sore. Was taking Hyd. c. cretâ, and was often sick. Bowels relaxed. There was a slight discharge from the right nostril. Advised the mother to leave off the powders and napkins, and to dress the inflamed skin with the ointment. On April 26th, having been short-coated, it seemed to be quite well.

Case X.—E. P., æt. five months, had been attending the hospital for two months; during which time she had been taking Hyd. c. cretâ three times daily, for alleged congenital syphilis. On April 22nd the skin of the nates, thighs, and hypogastric region was intensely inflamed; in other respects the child was well, except some looseness of the bowels. Advised the mother to discontinue the powders, to keep the child cooler by throwing off some flannel wrappers, to avoid the napkins as much as possible, and to dress the skin with the ointment. On the 26th the inflamed skin was nearly healed, but some redness remained. On May 14th the child was quite well.

Case XI.—J. H., æt. nine months. The mother had taken him to the hospital once every week for the previous six months; (yesterday

she went at nine a.m., and only reached home again at half-past three p.m.) During the whole of this time he had been taking powders of Hyd. c. cretâ three times daily, for supposed congenital syphilis, the symptoms of which still existed, viz., an ulceration at each side of and close to the anus, also two small ulcerations at the junction of the scrotum with the perineum. His general health had been good, but lately he had had a very sore mouth, and now had some swollen cervical glands. He was pallid. He always wore a small napkin because of loose bowels. Advised to discontinue the powders and napkin, and to dress the ulceration as above. I lost sight of this case.

Case XII.—On November 26th, 1872, I saw at a hospital, a case which was pronounced typical of congenital syphilis, and listened to a short clinical lecture upon it. The child was three months old. The symptoms which were pointed to as characteristic were an eruption on the nates, upper part of thighs, and inguinal regions, consisting of redness and some spots, some of which were ulcerated, and were pronounced mucous tubercles. Other signs were pointed out as diagnostic, but they appeared to me hardly cognizable: these were a *café au lait* colour of the skin; a patch of paleness of the mucous membrane where it is stretched from the hard palate on to the gum, said to be also mucous tubercle; and a depression of the bridge of the nose.

I followed the woman to her home and observed the following conditions, which were obviously sufficient to account for the cutaneous eruption. She was poor and possessed but a small stock of nursery materials; in order to save her bed from being soiled by its excretions she was accustomed to wrap the child in a coarse flannel, and so let it remain for twelve hours without a change. Although previously in good health, it was now suffering from diarrhœa, the effect of doses of Hyd. c. cretâ, which had been prescribed for it three times daily. The parents both satisfied me that they had never had syphilis. I advised a discontinuance of the powders, and more attention to be paid to keeping the child clean and dry, and I procured for it some linen napkins in place of the coarse flannel and small pieces of calico then in use.

On December 12th I found the eruption quite well, and the child much better in health, having regained its appetite, which quite failed while taking the powders.

On August 8th, 1873, I sought out this child, and exhibited it

at the Annual Museum of the British Medical Association. It had grown and thriven in the best manner possible; being now a remarkably strong and healthy child, which could hardly have been the case if it had really been the subject of congenital syphilis.

Case XIII.—A few years since a gentleman kindly gave me the address of a child he was attending at a public institution, and which he regarded as a typical case of congenital syphilis. I visited it, and found as usual that the diagnosis was based mainly on sore buttocks. The parents convinced me that they had never had syphilis. They were very poor people, with insufficient nursery accommodation. I found the child sitting upon a pile of rough woollen horse clothing, into which it discharged its excretions, and the mother informed me that it was here where she always placed it when she was engaged in her domestic duties. The inflammation was limited to the skin which was in contact with the woollen material, and the evil was increased by the state of diarrhœa which was maintained by the dose of Hyd. c. cretâ which it took three times a day. The mother was very glad to have the true nature of the case explained to her, and soon cured her child.

Case XIV.—On May 7th, 1873, a medical friend kindly sent to me a case which was seen by many acknowledged competent observers, and pronounced by all to be a typical case of congenital syphilis. The symptoms were as follow:—Very loud snuffles, weak voice, abundant eruption on legs, thighs, and nates, some on chin, face, and scalp. The right arm was thickly covered. The eruption consisted chiefly of circular discs with a dark centre and colourless space between it and the circumference; some were vesicated, resembling spots of variola; others, especially those about the anus and vulva, were ulcerated and moist, thus constituting mucous tubercles.*

The mother is apparently healthy, aged twenty-seven, twice married; in her first wifehood she had a still-born child, and a miscarriage. Two years ago was again married, and has since had

* The French writers frequently refer to the resemblance of these eruptions to that of small pox, designating them "*les eruptions varioliques.*" M. Devergie gives a drawing, marked "*Pustules Muqueuses resemblant aux boutons de la variole.*" Plate 19.

This character was well marked in the above case.

only this child. Both parents deny having had any venereal disease. The following were the unfavourable conditions which seemed to me to be the cause of the symptoms. The child was much wrapped in dirty flannel clothing; on its head was a red flannel cap or bonnet with a curtain, which hung down the back of its neck; around the neck was a woollen wrapper, in which the chin was buried, and which was dripping wet with saliva. Its thighs and legs were enveloped in a thick coarse flannel wrapper, which, with the napkin, was saturated with urine and fæces; it was besides closely covered by its long clothes. The mother, being left handed, could only carry the child on that side, hence its right arm was always in contact with her dirty red woollen shawl. She was also very poor and ignorant. I forbade any treatment except keeping the child cleaner and cooler.

On July 22nd I vaccinated it, and on the 29th, four good vesicles having been developed, I vaccinated myself from one of them, taking care to have some blood mingled with the virus. A good modified vaccine vesicle was produced on my arm, and has since healed up perfectly, leaving a fair scar.*

On August 8th I exhibited this child at the Annual Museum of the British Medical Association; and as all who saw it declared the eruption to be characteristic of congenital syphilis, I got my friend, Dr. Westmacott, to make a drawing of it, which is here reproduced. (Plate III.) Previously I had taken no pains to heal the eruption, but I now asked the mother to keep it dressed with the ointment, and in a fortnight it had all healed, and the marks were fading out. The child all the while has remained in good health, and is now growing and thriving perfectly. With this favourable result, and the proved innocence of the inoculation from the vaccine vesicle, it is fair and reasonable to infer, that this was not a case of infantile syphilis, and consequently it goes far to support my opening statement, that the subject is involved in much error.

I could relate several more cases to the same effect. One woman, who seemed quite to apprehend the force of my explanation, showing me an elder child, remarked, "When this one was an infant, she suffered in the same manner, and she was treated for some time with the grey powders, but she did not improve until I

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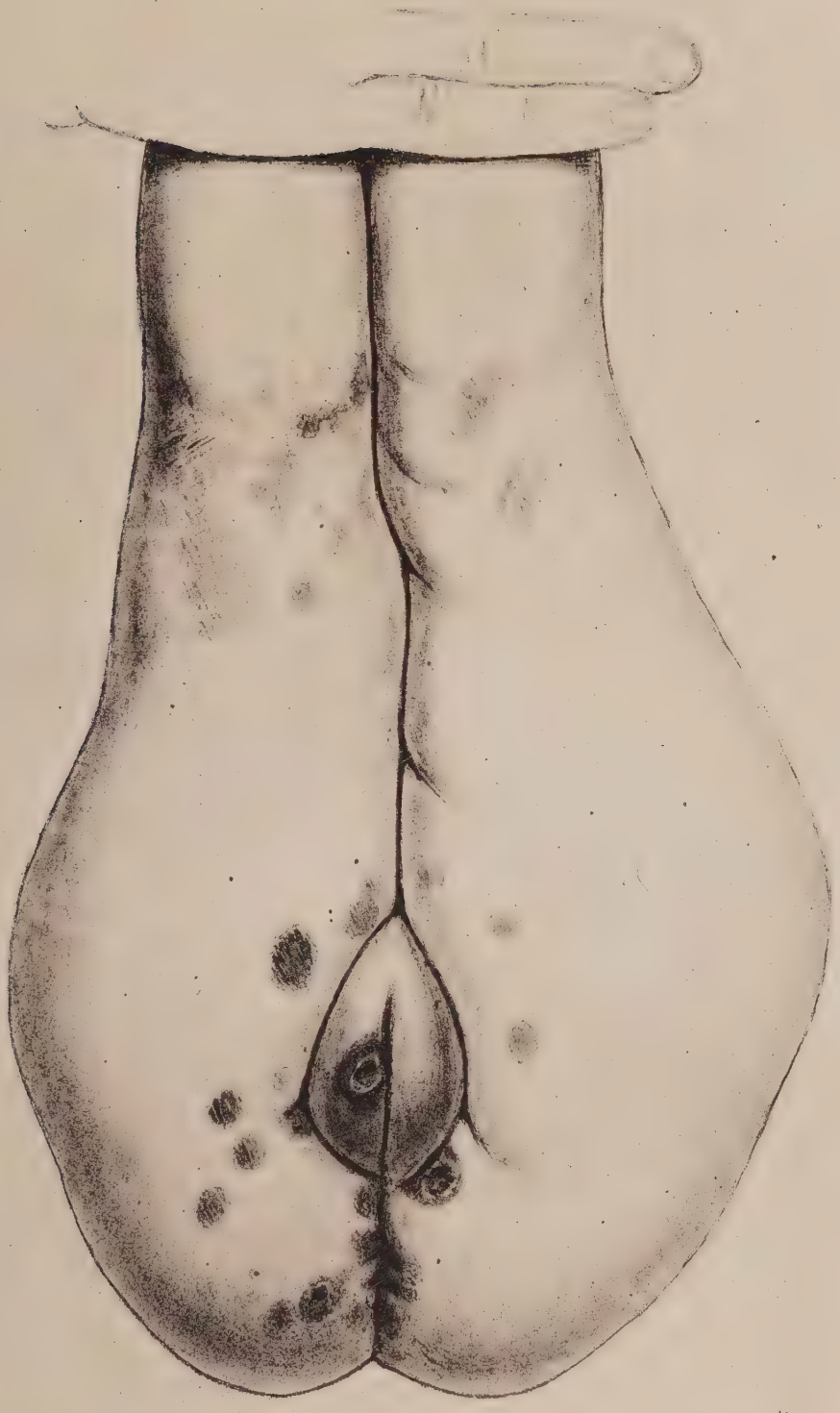
* April 1874.—Nine months have now elapsed, and I am free from any syphilitic symptoms.



Dr. Westmacott ad Nat.m Del.t Aug.ii 1873.

short-coated her, she then soon got well, and I have no doubt this one will do the same;" thus pointing to a very important feature in the means of recovery of many of these cases. Dr. Drysdale has published the case of a child, eleven weeks old, having on May 17th sore buttocks, which he considered to be congenital syphilis. He treated the case without mercury. In July it was nearly well; in October quite well. I suggest that the customary shortening of the clothes may have contributed materially to the cure in this instance. Mr. Allingham has invited attention to a favourable result of treating these cases, by directing them to be sponged twice a day with warm water, and zinc ointment to be applied to the inflamed skin. He tells us that of cases so treated, only one in fifteen died, whereas twenty-nine per cent. of those treated by mercury were fatal.

In spite of the favourite assertion of some physicians that infants fatten on a course of mercury, there is plenty of published evidence to show that the mortality of those submitted to this treatment is considerable. Dr. Drysdale mentions an infant eleven months old, plump and well grown, but covered with an eruption, treated by mercurial ointment on a flannel bandage. On November 8th the eruption had disappeared. On the 15th the child was dead. I would likewise direct attention to the case published by the late Dr. Tanner, in the first volume of the Transactions of the Obstetrical Society. An infant, a fortnight old, was pronounced to be suffering from syphilis. On October 7th ten grains of Ung. Hydrarg. was prescribed to be rubbed into the skin, night and morning. On November 12th the child died in the doctor's room. The only post-mortem appearance detected was a watery state of the blood. Thus well illustrating the characteristic spanæmic action of mercury. Dr. A. Förster records that "among thirty-six cases death occurred, in all but one, before the close of the first year, mostly during the first few weeks or months of life;" and in another paper, speaking of treatment, he says he uses "chiefly the proto-iodide of mercury."

The use of macintosh sheeting as an outside napkin, or to protect the child's bed, is a cause of cutaneous eruptions which are sometimes thought to be syphilitic. I saw a case of this kind several years ago, which was pronounced positively by an eminent physician accoucheur to be one of congenital syphilis, and I saw the child quickly recover by simply removing the napkin. I have seen children whose bodies have been covered with lichenous

eruptions, in nurseries where the family has increased faster than the means of the parents to provide efficient and sufficient nursing power. Indian-rubber is then freely used, flannels are sparely washed, and the skins of the children manifest, by various forms of inflammation, that they have been subjected to some powerfully irritating conditions. I consider it equally as erroneous to attribute such cases to teething as to congenital syphilis. The cause of them is obvious enough if it be looked for.

The vulvæ and scrotum are apt to become ulcerated, because it is on these parts that the strain of the application of the napkin is brought to bear, and hence it is that an ulceration once established there will persist as long as the use of a napkin is persevered with. Ulcerations occur and persist around the anus because of an intensity of the provoking cause. This part is exposed, not only to the constant heat and wet of the napkin, but to the influence of the highly irritating properties of the discharges from the intestine which are peculiar to the green stool diarrhœa of young infants. It is further irritated by the frequent wiping with a cloth, and, in consequence of the soreness, there is persistent contraction of the sphincter muscle, thereby drawing the nates into close contact. Some writers, I observe, refer the intestinal disorder to an extension of the disease internally from the anus, but surely this is not so reasonable as to attribute the soreness around the anus, in part at least, to the diarrhœa. Diarrhœa is the bane of infancy, there are few maladies independent of it, and if it persist long, or is severe, the infant must emaciate, and eventually succumb. Hence the appearance of the "miniature decrepitude" which is regarded as one of the chief characteristics of congenital syphilis. Billard believes that enteritis is the cause of it. Valleix ascribes it to thrush, and Bouchut considers it the result of gastro-enteritis. I suspect that, in all cases, diarrhœa and insufficiency of food are the two causes which principally operate to cause the wasting on which this state depends. The course of mercury, which is so commonly given with the object of curing the cutaneous eruptions, can only, except by a favourable accident, fail to promote it. I have found the principal cause of diarrhœa in young infants to be prolonged and forcible efforts to obtain their food by suction from a source which does not yield the coveted draught, (fruitless sucking,) and I have shown above that this is a principal cause of the inflamed lips and oral mucous membrane which has so frequently been regarded as a manifestation of syphilis. The sore mouth and diarrhœa constitute

the familiar infantile disorder known as thrush, a malady easily cured or prevented by taking care to avoid fruitless sucking. I have for many years past been accustomed to teach those engaged in rearing infants, so to manage them, that they have only two alvine discharges daily. If this be accomplished, and plenty of food administered, the best results of health and growth are attained.

Syphilis is not more prevalent among the poorer than the better classes of society. The cases of supposed congenital syphilis are principally observed among the poor and dirty people, who take their children to hospitals and dispensaries, and amongst whom the causes to which I assign the symptoms supposed by others to be manifestations of syphilis, are in force in much greater intensity; yet I am accustomed occasionally to see precisely the same in the nurseries of the wealthy. No one supposes that the effects of the syphilitic virus would be altered by the condition in life of the sufferer; we should therefore look for the same phenomena in all ranks of society, and thus I have found it. I have never seen anything in any rank to lead me even to suspect that a child suffered from its parents having had syphilitic disease.

The following cases illustrate this.

Case XV.—*Syphilis in the father; healthy children.*

A gentleman, aged twenty-seven, contracted a primary sore in July, 1866. In August he had ulcerated throat. In September he came under my care with an ulcer on the prepuce and secondary eruptions on body. In November he had pain in the shoulder, and a little hardness detectable in the cicatrix of ulcer. In July, 1868, he had severe pain in the right arm, shoulder, and scalp. On August 13th he was married. On the 14th he wrote to say the pains in the head are worse, and are getting unendurable. In December he was still complaining of vague pains about his scalp. In September, 1869, he had a slight attack of hemiplegia. In July, 1870, he died suddenly of apoplexy.

In July, 1869, his wife gave birth to twins, and in June, 1870, to another child, all of whom are remarkably strong and healthy.

Case XVI.—*Syphilis in both parents; healthy child.*

A married man contracted syphilis in the autumn of 1862. In the early part of 1863, he and his wife were under treatment for secondary symptoms. In 1868, the wife gave birth to a perfectly healthy child, which has since thriven and grown properly. The father is still suffering, and is now under treatment.

CASE XVII.—*Syphilis one year before marriage; healthy family.*

J. T. contracted chancre on March 1st, 1856. It was an ulcer on the 7th, and quite healed on the 24th, a hard base left. On April 24th he had lepra on arms and trunk, leaving copper coloured stains. Chancre again ulcerated. In May he was profusely salivated. In September he had sore throat and tongue. Ash coloured spots on velum palati, uvula, and tonsils; a hard raised spot denuded of epithelium on tongue. In July, 1857, he was married. His wife has given birth to five children, who have thriven well.

CASE XVIII.—*A married man, suffering from syphilis, begets a healthy child.*

R. R., married, father of several children, contracted syphilis in 1856. Was under treatment for ulceration of tongue, psoriasis of palms, &c., in August, 1857, and January, 1858. In July, 1858, his wife was delivered of a remarkably fine child, which has since thriven and remained healthy.

My object in the above remarks has been to invite attention to the value of those signs and symptoms which are relied upon as pathognomonic of syphilitic contamination of the infant, and to suggest that they are not really evidence of congenital disease, but are accidents arising from certain unfavourable conditions to which the child is exposed; and I have limited my observations to the signs of congenital syphilis in the infant, because this seems to be the foundation of the whole subject of hereditary syphilis. The French writers allege that if the disease breaks out after the third month, it is, in all probability, not inherited.

The conclusions which I have arrived at are here epitomized, and I submit them to the careful consideration of my professional brethren.

(1) That the death of the fœtus in utero is the consequence of some defect in the maternal system, resulting from contamination by the syphilitic virus, and that it is not necessary to infer, neither is there evidence to prove, that the organism of the child is intrinsically affected by it. The partial decomposition of the cuticle observed on the bodies of still-born children is satisfactorily accounted for by their maceration, probably for some weeks after death, in the liquor amnii.

(2) That the records of cases of living children having been born with manifestations of syphilitic disease are so few as to allow of the supposition that they are not trustworthy.

(3) That pemphigus and other forms of erysipelatous disease which may occur within a fortnight after birth, and have been regarded as syphilitic accidents, are pyæmic affections resulting from an unhealthy suppuration of the umbilicus, which is produced by the child being subjected to certain unfavourable conditions.

(4) That the symptoms which are developed some weeks after birth, and are relied upon as pathognomonic of syphilitic contamination of the system of the child are mere accidents, arising *also* from certain unfavourable conditions to which the child is exposed, and that they are all preventible or easily cured when the cause producing them is recognized.

(5) That, consequently, the practice of subjecting infants to long courses of mercurial treatment is not necessary, and is prejudicial to their healthy growth.

ON THE RELATIVE FREQUENCY AND VALUE OF CERTAIN SYMPTOMS OF CONGENITAL LUES.

By W. Bathurst Woodman, M.D.,

Assistant Physician to the London Hospital, and Physician to the North-Eastern Hospital for Children, Honorary Secretary of the Association.

Many of us have perhaps thought that the labours of Diday, Lancereaux, Henry Lee, Hutchinson, and other observers, had established the fact of hereditary transmission of the syphilitic cachexia almost beyond question, doubt, or cavil. The temper of our age is however less easy to be persuaded; it bends to no authority, however eminent. And now that Dr. Ballard has boldly thrown down the gauntlet, and has plainly asked the question, as if it had never been asked before, "Is there such a thing as hereditary syphilis?" the medical public, and all who are interested in this question, will probably demand fresh evidence, rather than be content to refer to any published works or papers, however eminent their authors. This paper can only be taken as an incidental contribution to the new evidence which will doubtless be furnished abundantly toward the solution of this question, because my object is rather to direct attention to the relative value and frequency of certain symptoms, than to discuss their ætiology. It may, however, be taken as an indirect and independent witness on the question, for this reason: it is based upon two hundred cases of children, in all of whom one parent was known to have suffered severely from syphilis, and in all but four or five there was evidence that *both* parents had so suffered. All but three were patients of the North-Eastern Children's Hospital, and I made it my endeavour to sift the evidence as carefully as I could. In the majority of these cases I saw both parents myself, at some time or another. And a very large number of them admitted having had syphilis, so that I did not rely merely upon symptoms in the case of the parents.

These data are derived from rather more than five years' experience at the Children's Hospital to which I am attached. My notes of cases of infantile syphilis were nearer five hundred than two hundred, but I have rejected all those in which I had not clear reasons for believing both parents to have contracted the disease, and I have rejected all in which the symptoms appeared to me at all equivocal.

Of the two hundred cases, exactly half are males. Although this may seem a singular coincidence, there seems *à priori* no special reason why sex should give immunity or predisposition in this case. As regards the special lesions, however, male infants have seemed to me rather more subject to thrush and affections of the mucous membranes than females of the same age. More than half of the cases were under two years of age, and only twelve (or six per cent) were more than five years of age. I have therefore thought it useless to give any tables of the exact ages at which the various symptoms occurred, preferring to remark on the subject of age under the various symptoms.

The following is the relative frequency of the disorders named, in the two hundred cases (one hundred males and one hundred females) referred to.

TABLE OF DISEASES IN 200 CASES OF CONGENITAL SYPHILIS.

Diseases.	No. in 200 Cases.	Per Cent.	Diseases.	No. in 200 Cases.	Per Cent.
Thrush.....	131	65·5	Mucous Tubercles ..	39	19·5
Snuffles	108	54·0	Adenitis (see explan.)	32	16·0
Gummata.....	84	42·0	Nodes on long Bones	10	5·0
Specific Skin-diseases	71	35·5	Enlargements, &c., in Internal Organs ..	6	3·0
Disease of Anus and Genitals	59	29·5	Iritis or Corneitis ..	5	2·5
Glossitis & Gingivitis	45	22·5	Notched Teeth.....	5	2·5

Taken by itself the table is of little value, but read in the light of the clinical histories, it conveys to my own mind an almost overwhelming proof of the extent and duration of the ravages of syphilis in the early periods of growth and development; for during the period named, more than ten thousand children (besides the five hundred children named) have come under my notice, and if the same symptoms had been present in anything like the same proportion in the children of parents who presented no obvious

symptoms of syphilis, the numbers in my table must have been multiplied by fifty at least. On the contrary, the five hundred named include *all* the cases in which I could fairly attribute the symptoms to a syphilitic taint. Lest this mode of speech should be considered a *petitio principii*, I will guard myself by explaining, under each heading, the special characters presented by the particular symptoms in the two hundred cases of which the parental history is well known.

PARENTAL SYMPTOMS.

It has been stated previously, that a great majority of the parents admitted having had syphilis. It is, therefore, not necessary to minutely analyse the cases. In order, however, that it may not be objected that this may have been a mistake on their part, and that they really may have suffered only from urethritis or vaginitis, and kindred diseases, I wish to record that all the mothers and most of the fathers suffered from secondary and tertiary symptoms: such as skin diseases, particularly palmar and plantar-psoriasis; onychia; loss of hair; ulcers of the tongue, tonsils, and of various mucous membranes; recurring iritis, ulcers of the "punched out" type on the legs, gummy tumours, nodes, and necrosed bone. In addition to these symptoms the mothers had also suffered from repeated miscarriages, and had had numerous dead-born children. Five or six miscarriages and three or four dead-born children were common. I have also noted fourteen miscarriages and eight dead-born children in the case of one woman, who had but one living child.

THRUSH IN INFANTS.

The per-centage given in the table really represents a very small proportion of the cases which actually occurred; the reason being that I have noted there only the cases *treated* by me. Thrush actually occurred in nearly all the two hundred cases, and in nearly all within six weeks of birth. The statement, so commonly made, that "the child was born quite healthy, and remained so till the mouth got sore," must be taken as merely a popular statement, and not as literally true. A large proportion of these children were not only premature, as regards their birth, but had an unmistakably senile look. The causes and varieties of stomatitis

in children are very numerous ;* and often difficult to diagnose one from another. I am therefore indisposed to lay much stress upon the existence of thrush as a symptom of hereditary syphilis, but the following appear to me somewhat characteristic features.

(1) Its early occurrence.

(2) Its tendency to relapse.

(3) The numerous points of ulceration, which are less symmetrical than those of simple herpetic stomatitis, less virulent than noma or cancrum oris, and more circular than arsenical sores.

(4) It may be accompanied by other symptoms, such as snuffles, sores at the angles of the mouth, and pemphigoid eruptions.

(5) Its colour, at least in the earlier stages, is less brilliant and pearly than the patches of true thrush or *muguet.* The colour of these vegetable growths has been well insisted upon by Trousseau, with his accustomed eloquence. He considers the comparison to the blossoms of the lily of the valley a good one, and such indeed it is; whereas the syphilitic thrush is of a dirtier tint. Of course the two may be combined; and in the later stages some form of vegetable growth is often superadded to the original disease. For this reason, I have retained the common name of "thrush" in preference to any more definite nosological term.

(6) The parental and family history may perhaps furnish us with useful hints.

(7) Purely local treatment will seldom (at least in the poorer classes, or in bad cases of thrush in better cared-for infants) be found of much use; whereas in the parasitic or vegetable thrush this will almost always be sufficient for the cure.

"SNUFFLES."

Chronic coryza, affecting the mucous membrane of the nose; though marked in the table as somewhat less frequent than thrush,

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* Amongst *causes* the following may be mentioned:—starvation; dirty utensils and sour food (giving origin to fungi, confervæ, and other low forms of vegetable life); arsenical pigments, and furs preserved by arsenic; phosphorus poisoning; herpetic and contagious catarrhal affections; and the exanthemata.

is probably quite as common, or more so. I do not claim any special knowledge on this point, and the only remark I wish to offer on this symptom is, that I have very frequently known it mistaken for bronchitis. It might be thought that only ignorant practitioners could make such a mistake, but the reverse has not infrequently occurred in my experience. Of course the fact that the dyspnœa occurs almost entirely during lactation or feeding, the cessation of the râles when the nostrils are compressed, the less frequent respirations, and the absence of the thoracic signs of bronchitis, easily enable us to discriminate in cases where there is no bronchial affection.

SORES ON THE TONGUE, LIPS, AND ABOUT THE ANUS.

The same children who suffer from thrush in infancy, are often troubled through the whole of childhood with intractable (as regards purely local or non-syphilitic treatment) sores on the tongue, the commissures of the lips, and within and about the anus. These sores are sometimes symmetrical, but more often, like the majority of tertiary ulcers on the legs in adults, are one-sided. The base of the sore is deeply fissured, and generally indurated; the sores themselves often have a worn look, and remind one of a hat the worse for wear. On the tongue, which is seldom so deeply fissured as in adults, there may often be seen a patch which looks as if a hot iron had been passed over it. And the neighbouring glands are usually found enlarged (but not very greatly) and very hard. These glands seldom suppurate.

SKIN DISEASES.

Pemphigus, (which is not seldom confounded with varicella,) gyrate and annular forms of psoriasis, rupoid ecthyma, and mucous tubercles, spreading from such parts as the vulva, anus, commissures of the lips, &c., are the most common and the most definite of these cutaneous maladies. But there are many more of these cases which present rashes of a mixed character. In fact, so often has this occurred, in the same series of cases, and in the same children, who have presented the more definite lesions, that I have not hesitated to endorse the dictum of a famous dermatologist, that a skin disease, which is not scabies, and yet presents a combination of the characters of other cutaneous diseases, is, in all human probability, and by very virtue of this character of "mixedness," a syphilide.

If we adopt these opinions, we shall have the following general characteristics of syphilitic skin diseases.

(1) Their colour is often peculiar: coppery or bronzed, or of a dirty tint, with mottlings.

(2) They often mix or mingle to the naked eye, the characters of two or three varieties of skin-disease.

(3) They are very chronic, often symmetrical, and have a great tendency to scar, or, in other words, to leave their mark upon the patient's body.

The most noteworthy skin disease met with is that generally known now as Xeroderma, a name which is sanctioned by Mr. Hutchinson. In one of the families treated by me, four children born previous to the parents' syphilis had very nice, clean, clear, soft skins; the four next in age, born after the chancres in the parents, had coarse, red, raw-looking skins, dry, and thick, with large epithelial scales, in fact looking very much as if they were just recovering from a very bad attack of scarlatina, only the skin was more thickened and more prone to crack. Warm baths, oiling, and the use of mercury and the iodides, have effected, in the course of time, considerable improvement in these cases, and in others of the same kind. I have made them sleep in the greasy garments, clean ones being put on in the day-time.

GUMMATA AND MUSCULAR NODES.

Gummata occurred in eighty-four of the two hundred selected cases, which is equal to forty-two per cent, or nearly one half. The same little patients were often brought for five, six, or seven successive years, for a recurrence of the same symptoms, but I have not included repetitions in this or any of the other observations. My experience is that there is no more certain mark of inherited syphilis; in other words, these affections occurred in cases with the clearest history of parental syphilis on both sides. Yet, though perfectly characteristic, gummata are often mistaken for boils, even by medical men, and are constantly called boils by the parents. As Diday's work on Infantile Syphilis, and many of our text books, omit all description of them, it may not be amiss to dwell a little on the characters of gummata. It is not possible to make the

diagnosis simply from the locality, for, like boils, they occur in all parts of the body, but not indifferently. A very favourite situation is the fleshy part of the buttocks; the inner side of the thighs and of the forearms are other common sites. But when solitary, they not seldom come in the cheek, on the shoulder, in the neck, or on the dorsum of the foot or of the hand. They are often solitary, but when multiple will commonly be found all on one limb, or on one half of the body, like tertiary ulcers. I have met with them as early as five weeks, but they are more common after the first dentition, and before puberty. They seldom require the knife, except for cosmetic purposes; in other words, if an incision is required, it is only when the skin has been hopelessly undermined, and this is often the result of injudicious treatment, very often of poulticing, which is very seldom necessary or judicious. In the great majority of cases the skin may be preserved, and the gumma may be completely absorbed by early and appropriate treatment. The typical gumma is soft in the centre, slightly raised, and more or less flattened; in other words, less acuminated than a boil, and surrounded by a well-defined ring of induration, so that the whole much resembles a wooden ring covered with wash-leather. In its earlier stages the skin is often not at all discoloured, afterwards it commonly has a purplish colour, with less of a bright or "angry" red than is common to boils. There is thus a strong resemblance to a button, and hence the French name of "*boutons*" which is given to gummata. The true gumma is seldom deeper than the subcutaneous areolar tissue, and can therefore be freely moved over the subjacent muscles. This character is of course not diagnostic. Its contents, as indicated by the name, are of a gummy, glutinous nature, like a solution of gum acacia, and, like that, they may be very thin, or very thick and tenacious, but they are rarely or never true pus. Even when they are said to "suppurate," the so-called "pus" is badly formed, shreddy, thin, and mixed with blood. When two or more of these gummata are closely adjacent or coalesce, the figure is of course less circular; and the induration surrounding them may be of a dumb-bell or figure-of-eight form, thus ∞; or elliptical; or like three 0 0 0's thus arranged, ⁰₀⁰. As may be easily imagined, and except for being covered with skin, there is no essential difference of figure between these and two or three tertiary sores when situate close to one another.

The primary object of our treatment should be to procure absorption, without destruction of the skin; and at the same time

to improve the general health. To secure these objects, I generally give the iodide of iron in an extemporaneous form like this :

℞ Vin. ferri, ʒj ad ʒij.
Potassii iodidi, gr. ij ad gr. iv. M.
Fiat dosis ter die sumendus.

Should there be more than one of these gummata, it will be well to employ mercurial inunction, or small doses of Hydrarg. cum cretâ or of Calomel. The diet, which should be specially attended to, should be nutritious and easily assimilated; sometimes it may be necessary to prescribe stimulants, and to combine cod liver oil with the medicine. To save the skin, if not too much undermined, either collodion, or glycerine with tannin, or support with cotton wool and a bandage, is generally all that is required. On parts, such as the cheek, not exposed to pressure, no local treatment at all may be necessary. On the buttock, and elsewhere, where there is much pressure, it may be well to apply a plaster, perforated in the centre after the pattern of a corn plaster, of soap, lead, or some other non-irritant, but sufficiently adhesive, material, spread upon felt, or amadou, or upon two or three thicknesses of chamois leather. We can thus from day to day watch the gumma without disturbing its surroundings. But if the skin threatens to give way, it is better to make a sufficiently free incision at once, and then apply some simple unguent, and firm but light compression. It may be easily imagined that post-mortem examinations of such cases are very rare under proper treatment. I will not therefore dogmatise on the actual nature of the morbid process. It is commonly regarded as a sort of exudation of a low form of connective tissue plasma,* but I confess my own view of their origin strongly leans to the view that there is a local embolism, or at least thrombosis, and that they originate in plugging of vessels.

Had I included the larger, more irregular, and brawny indurations occurring in the connective tissue and fasciæ, the percentage of cases would have been much larger. But although these undoubtedly occur in specific cases, and occurred in this series very frequently, they are less characteristic than either gummata or muscular nodes; and it is not so easy to differentiate them from certain forms of œdema, and diffused abscesses, and cellulitis of a

* See "Rindfleisch," Dr. Baxter's translation, vol. I, p. 134. New Sydenham Society.

low type, except by that sort of wisdom which comes after the event. I am, too, not at all clear that they may not occur soon after some other of the exanthemata, and for this reason I have excluded them from the table. As regards the specific nature of any symptom, I must also refer to my concluding remarks in deprecation of any charge of rashness on this point.

In a doubtful case, the previous history of the child and its *parents*—using that word in the wide sense of including all the blood-relations who may be nearly allied—may serve to give us hints as to the treatment.

TABLE OF THE CHIEF DIFFERENCES BETWEEN BOILS AND GUMMATA.

BOILS.	GUMMATA.
Have a great tendency to point, or assume a conoidal form; and scarcely ever terminate without destruction of skin.	Are not so acuminated, but are flatter, and more rounded on the surface; they often disappear without any destruction of skin.
The skin is always implicated in the inflammatory processes, even in early stages.	In early stages the skin is often quite free from colour, and not so implicated.
Induration is general, and fluctuation not easily made out at first.	The induration is more or less *annular*, often strikingly so, and the centre is always soft and fluctuating.
The contents are *thick* and purulent, with a hard core, or shreds.	The contents are generally very like thin, dirty gum water, and the shreds are fine; there is no distinct core.

MUSCULAR AND PERIOSTEAL NODES.

Muscular nodes are not very uncommon in the subjects of inherited syphilis. They are, I think, somewhat less frequent in children than in adults; indeed, I have found the ages of forty to fifty years most subject to them. I suspect that in children, they more often come under the surgeon's notice than under that of the physician. Still I have met with numerous cases, even in children, but am sorry to say I have not preserved accurate notes of their frequency. It appears to me that the diagnosis is not difficult; the only affections very liable to be confounded are deep-seated abscess and phlebitis. In the former, the course of the temperature

would probably help us; and the absence of cord-like induration of the veins, as well as the absence of general œdema, (like white leg,) would enable us in most cases to distinguish this affection from phlebitis.

Ten cases out of the two hundred were marked by periosteal nodes, on several bones at the same time, and of the most striking character. This amounts to five per cent of the cases. Our consulting surgeon, Mr. Hutchinson, saw several of these cases with me; and one or two of them were, I believe, shown at the Hunterian and other Medical Societies. In one boy, aged three years and a half, every long bone was thus affected; and he presented a most extraordinary appearance, from the amount of swelling giving his lower extremities, in particular, a very gibbous and uncanny aspect. The deformity was easily distinguished from rickets, by the fact that the shaft, and not the epiphyses, was chiefly affected. Although not free now from other syphilitic symptoms, he has quite recovered from this affection.

I have found iodide of potassium in *large* doses (gr. ijss to gr. x.) considering the age, combined with mercurial inunction and the external use of iodine, the best treatment.

DISEASE OR DEFECT OF THE TEETH.

It may not unreasonably be asked, why this figures as only two and a half per cent in my table, whilst Mr. Hutchinson lays such stress upon this diagnostic mark? The answer is simple. The characteristic test-teeth are the central permanent incisors of the upper jaw. Now less than ten per cent of my cases had attained the necessary age to show this peculiarity. The fact that more than half of these did show it in a marked degree, is a strong confirmation of my argument, and needs no comment to a candid mind. But readers who know Mr. Hutchinson's views on specific keratitis (corneitis) may require some explanation of the small per-centage of eye-cases in my table. I therefore pass on to

CASES OF DISEASED EYES.

These are put down at the low figure of two and a half per cent or five in the two hundred. Whilst the explanation of age may partly explain the fewness of these, I believe the true explanation is to be found in the contiguity of Moorfields Ophthalmic Hospital, which has acquired a reputation in specific eye diseases, on account of Mr. Hutchinson's researches, and the care and interest he and his

colleagues there have devoted to these cases. It is, however, very remarkable that four out of the five cases thus seen by me, were cases of iritis, and it is known that this disease, except the traumatic form, is rare in childhood and infancy. Yet it was well-marked, severe, and recurrent, in these four cases. In all four both parents had had chancres, and severe symptoms of constitutional syphilis. The fifth case was one of severe interstitial keratitis.

SYPHILITIC DISEASE OF INTERNAL ORGANS.

Of this there were six cases, or three per cent. The liver was affected in five, the spleen in three, whilst *both* organs were affected in four of the cases: or, more clearly,—spleen only, one; liver only, one; both organs, four; total of six cases. Enlargement of the organ affected, with induration which on careful palpation was found to be softer in the centre; the gradual disappearance of this, and of the enlargement; the history of the child and its parents; and the existence of some other symptoms of the disease, —were the characters which induced me to make, and persist in, the diagnosis of gummata of the organs referred to. In one case, however, a male child aged six months, I obtained a post-mortem, which showed characteristic tumours in the spleen and liver, and numerous circular ulcers in both large and small intestines. The lungs and other organs were quite free from tubercle. I have no moral doubt of the existence of cerebral, pulmonary, and other gummata in some of my cases, but as they were not verified by post-mortem examination, I will not encumber my argument with them.

SPECIFIC ADENITIS.

One of the articles of my pathological creed, and one on which I most strongly insist, is the extreme rarity with which lymphatic glands are primary seats of disease. Over and over again have I demonstrated at our Children's Hospital, and also at my out-patients' clinic at the London, how "strumous" glands, which resisted cod liver oil and other supposed appropriate medication, got rapidly well when let alone, if only we got rid of the porrigo or pediculi, or both combined, met with on the hairy scalp of such cases. I have therefore omitted from my notes all cases of glands which have obviously been "sympathetically" affected from contiguous sores, or other obvious causes. The thirty-two cases (or sixteen per cent) in the table were cases of glands presenting a bullet-like

induration, like those affected by a Hunterian chancre; but, at the same time, they were cases where no obvious sore could be discovered. As Lebert (who was, I think, the first to insist strongly upon the specific character of this adenitis, although Ricord and others had noticed its occurrence) remarks, the favourite seat of these indurated glands is generally the posterior part of the neck; the glandulæ concatenatæ, the axillæ, and the groins will, however, often furnish us examples. Their extreme hardness and tenderness, and the fact that they seldom suppurate, but remain as small tender bullet-like bodies for weeks and even months, furnish diagnostic characters. The skin and connective tissue around them do, however, suppurate at times, and the glands themselves occasionally assume a considerable bulk. In adults, this character, and the ugly sores left when the skin gives way, along with the severity of the pain, often give rise to the suspicion of cancer, and I have known them removed for malignant tumours. It seems highly probable that these glands are secondarily affected by syphilitic disease of some part out of sight, but in the track of the lymphatics; of this, however, I can offer no direct proofs. The less done to the glands themselves, or to the skin over them, the better in most cases; but inunction of mercurial ointment, or other specific treatment, will generally be found effective.

PARALYTIC AFFECTIONS.

There are only five cases of these in my notes of the two hundred, or two and a half per cent (not included in the table). Of these, one, that of a female infant, aged four months, must be excluded as doubtful, because almost all the muscles supplied by the musculo-spiral nerve in the right arm were found to be paralysed; and I had reason to believe, as it was said to be congenital, and the labour was a difficult one, that the injury was local, due to some (probably unavoidable) violence in the act of delivery. The other cases were all of hemiplegic type, and as there were other well-marked symptoms of syphilis, as well as a good history, I have no hesitation in recording them. Such cases are not very uncommon, and I have met with more at the London Hospital, in some of which the success or apparent success of treatment was very marked, especially in regard to the general gain of weight and strength, as well as of power in the paralysed limbs. In these cases, the paralysis is often more or less "crossed," especially as regards the face and limbs, sometimes as regards the limbs themselves. In two

of my cases, the right arm and the left leg, and the left arm and the right leg were thus affected; but very often (speaking of such cases generally) the crossing is less obvious, and consists more in weakness of a limb than in absolute paralysis.

MUCOUS TUBERCLES AND AFFECTIONS OF THE ANUS.

So much has been written by special writers on syphilis and on diseases of the rectum, that I content myself with giving the number of cases in the table, only pausing to remark that the mucous tubercles referred to often occurred on the mucous membrane of the mouth, soft palate, and tongue, and that the diseases of the anus, distinguished from them, were cases of fissures and deep ulceration of its mucous membrane, generally associated with the rational signs of disease of the whole of the large intestine. It is, however, due to Dr. Ballard, not to omit mentioning, that mucous tubercles of the anus have, in my practice, occurred in the cleanest and best tended of my cases, where the mothers were careful and cleanly; and that I have never seen a case which could fairly be referred to want of cleanliness, although this is of course a common enough cause of certain forms of eczema. In both these affections, it is very important to combine local treatment with the general. The glycerine of tannin of the British Pharmacopœia, and its zinc and nitrate of mercury ointments, (the latter diluted,) have done much good in many cases; but when I can, I prefer to use Mr. Luke's powder of one part of calomel to eight or more of finely levigated oxide of zinc. The free use of nitrate of silver, especially about the anus, and within it, is, though somewhat painful, a very successful treatment, when combined with internal specific remedies.

MARASMUS AND DEFORMITIES.

These, and some other consequences of syphilis, I have totally omitted from the table, because the former is so often due to other causes, or, if really syphilitic, is in infants less often due to the fever of that disease in the child, than to a vitiated or deficient quality or quantity of its mother's milk, and as regards the latter, particularly hare-lip, I propose to offer remarks elsewhere. I am not one of those who deem that all diseases or disasters can be referred to syphilis. And I will go still further, and say that there are very few, if any, of the so-called sequelæ or signs of syphilis, which are absolutely peculiar to that disease, or diagnostic of its

having previously occurred. But just as cavities in the lung follow tubercles, as mumps is a frequent sequel of measles, as acute desquamative nephritis is a sequel of scarlatina; so, in the adult, certain diseases, as nodes and palmar psoriasis, commonly follow syphilis; and so, in the child who has taken syphilis in utero, in partu, by lactation, or in any other way, certain symptoms, as gummata, typical teeth, and the like, will be met with. My argument is, that it is the accumulation of such symptoms in one individual, which gives us a right to infer the previous disease. On adding together the symptoms I have alleged, it will be seen that each child of the two hundred came under my treatment for at least *three* of the different classes of affections, and this at different times, and excluding all repetitions and mere coincidences. *I have not put down the attacks for which they were treated by other medical men;* in other words, what I have written is what I myself have seen. All the errors of observation are mine, and mine only, though my judgment was often confirmed by my colleagues. But leaving the largest margin which experience of human errors might induce us to do, for faulty diagnoses, we have here the remarkable fact that out of some thousands of children, only about two hundred present certain classes of disease, and enquiry into their history gives clear and unmistakable histories of syphilis in the fathers and mothers, generally in both. Now, since the thousands free from such history and from such symptoms have been equally exposed to dirt, to the exanthemata, and to other causes which might be supposed to explain their attack, why have they escaped? The coincidence is at least a curious one, and I am content to rest my cause upon this, and upon the success of specific treatment.

The candid reader will forgive my frequent introduction of well-known matters, since, for the purposes of my argument, I wished my readers to see the cases (as far as pen and ink would permit) with my eyes, so to speak; or at least to regard them through my spectacles, as in no other way could the truth of my statements be equally well attested, and the truth or error of my explanations be made manifest.

CLINICAL AND THERAPEUTIC MEMORANDA.

By W. Bathurst Woodman, M.D.,

Assistant Physician to the London Hospital,
and Physician to the North Eastern Hospital for Children,
Honorary Secretary of the Association.

THE ARCUS SENILIS IN EARLY LIFE.

I suppose all members of our profession who are in the habit of examining large numbers of patients, whether in hospitals, the public services, or in private practice, are familiar with the fact that the appearance in the cornea known as the arcus or annulus senilis, is not very uncommon at the age of thirty. The very fact of its occurrence at early ages, and the occasional absence, or slight amount, of degeneration in the radial and other arteries, has led many physicians to think lightly of this sign of senility (in a physiological or pathological sense) first pointed out by Mr. Canton. I am not quite sure if any one has ever published observations of the occurrence of the arcus in infancy and childhood, although it has doubtless been noticed by many acute observers. It may, therefore, be worth recording that I have seen this symptom as early as the age of one year, and have notes of several cases at six, eight, and ten years. It may be worthy of note that the youngest case had been largely dosed with spirits by the mother, and that the others had suffered from various and complicated disorders, which had prematurely aged them; and in all the cases, except one, stimulants (wine or spirits) had been freely administered, either by medical advice, or under the idea that the children, being weak, required support.

TOPHI IN THE EARS OF INFANTS.

At the North Eastern Children's Hospital several infants have from time to time been brought with gouty deposits in the ears. The youngest case I have seen was a boy who was only eight months old. To set the nature of the deposit beyond doubt, I

submitted it to microscopic and chemical examination. It consisted of acicular crystals of urate of lime and urate of soda. In all these cases gout was hereditary, often on both sides of the family. As we know that infants are born with uric acid infarction of the tubuli uriniferi, the occurrence of tophi in the ears is probably more common in children than we should *à priori* suppose.

ENURESIS.

Nocturnal incontinence of urine in children springs from a variety of causes, chiefly local irritation of the urino-genital tract; it is thus a reflex phenomenon in the vast majority of cases. I have treated at some length of this affection in *The Medical Press and Circular* for February 28th and March 6th, 1872, and need not therefore do more than say that further experience confirms the truth of the views thus enunciated. I am also glad to find that so acute an observer as Dr. Bradbury, of Cambridge, takes a precisely similar view of this affection to my own. As Dr. Bradbury's paper in *The British Medical Journal* appeared a little before mine in *The Medical Circular*, I trust I shall be excused for stating, in justice to myself, that my clinical lecture was delivered several months before, and was, I believe, in type several weeks before Dr. Bradbury's paper, although not published till afterwards. In all cases of enuresis, our duty to our patients requires a careful examination of the individual case, and this may include: (1) the personal and family history, with special reference to neuroses; (2) a careful examination of the urine, with special reference to its acidity or alkalinity, the presence of albumen, sugar, uric or oxalic acid, phosphates, and the like; (3) a careful examination of the patient, with reference to spinal disease, to nervous disorders, and especially as regards local causes of irritation, about the pudendum, or in the bladder or rectum. The treatment, it is obvious, if it is to be at all rational or successful, cannot consist solely of any one drug for all cases, (for this is essentially quackery,) but may range from a simple course of warm baths and cleanliness, or the use of an alkali or tonic, in one case; to circumcision, or galvanism, or even to lithotomy or lithotrity, in others.

CHRONIC LEAD-POISONING.

A great many cases of this come under treatment at the London Hospital, not only in painters and those working in white-lead works, but also in those in whom it has arisen from accidental causes.

Amongst such causes I may mention :—(1) The use of cosmetics, hair washes and face powders, containing lead. (2) From articles of food or drink containing lead, or wrapped up in foil largely composed of that metal. Drinking water, cheap sherries, tea, cocoa, tobacco and snuff, and many similar articles come under this category. A short time ago I had a case, in private practice, of a gentleman and his wife suffering from lead colic, with well-marked lead line upon the gums, which I traced to the accidental occurrence of a lump of solder in a tin of mulligatawny soup, the acid of the soup having acted upon the lead in the solder. Barmaids and servants in beer-houses sometimes suffer from drinking ale or porter which has been all night in the pipes of the beer engine. Several such cases have come to me, and Dr. Corner, of Poplar, tells me that he has seen several. (3) The use of lead in certain trades, such as the glazing of cards, or the use of pigments containing lead, the chief of which are yellow colours of various kinds, chromates and the like, may be a source of the poison. I have known some compositors to suffer from lead-poisoning, and have failed to trace any other source of contamination than the type metal. It is possible that these men, as such cases are certainly rare, possessed some peculiarity of constitution which rendered them unusually susceptible to this kind of toxæmia. Having tried a variety of methods of cure, I can unhesitatingly say that no drug can compare with the iodide of potassium, recommended for this purpose by M. Melsens. I have seen cases of complete paralysis of the extensors of both arms, which had lasted over four years, completely cured by this treatment. Warm baths, particularly sulphur ones, considerably accelerate recovery, and Faradisation of the affected muscles is often of great service.

ARSENICAL WALL PAPERS.

A number of cases of chronic poisoning by arsenical wall papers have come under notice at the Children's Hospital. As the symptoms are now pretty generally known to the profession, I only wish to state here, that it is an error to suppose that only the bright green papers (Scheele's or Schweinfurt green) are injurious in this way. Yellow, red, brown, and violet papers have several times in my experience been the *corpora delicti*, and have been found, on examination, to contain arsenic. This is particularly the case since the introduction of aniline dyes. The arsenical pastes used by furriers have also proved sources of danger in several cases, and a

favourite toy of children, "the woolly lamb," has sometimes caused dangerous symptoms, the wool being found strongly impregnated with arsenious acid. In the East of London, too, some confectioners still use arsenical and saturnine pigments to colour cheap confectionery.

ALBUMINURIA, A CAUSE OF MARASMUS.

Several very striking cases of wasting due to renal disease, with constant flow of albumen, have presented themselves at the Children's Hospital I attend. The albuminous urine and great loss of flesh have been the only overt symptoms in three or four cases. One case, that of a girl aged ten, very forcibly reminded me of a young lady in the higher circles, who was sent to Torquay for supposed disease of the chest, and who died there; having been examined by several eminent physicians, with negative results as far as the examination of the chest went, but her urine, till shortly before death, had never been examined. At the autopsy, the kidneys showed extensive and long-standing disease. The little girl of whom I speak, was also supposed to be in a decline; she was reduced by rapid wasting almost to a skeleton, but no other sign of disease could be detected, except that the urine was loaded with albumen, so as almost to solidify on boiling.

ON SO-CALLED "CHILDREN'S FOODS."

The great majority of "foods" for babies and young children, so freely advertised, and so extensively puffed, and prescribed by chemists, and too often, I fear, by members of our own profession, are utter rubbish, and, more than that, are actually injurious. Most of them are merely starch, more or less badly prepared, and even some of the best of them, either from carelessness in preparation, or from being kept too long, become positively harmful. Liebig's food, for instance, the sale of which, under the guise of charity, was so industriously promoted by a titled lady in the East of London, may, when fresh and well prepared, be of great service in some cases; but many of the samples I have examined were quite spoilt, being sour from lactic acid, and in some cases even putrid, although sold as quite fresh. Dr. Ridge's food, again, (as sold to me on several occasions,) often contained when examined, little but unbroken starch granules, quite unfit for an infant's stomach before the first dentition. It is possible this was due to hasty preparation, imperfect mixture of the ingredients, or careless pack-

ing, but the fact remains, be the explanation what it may. For the *rationale* of the inability of young infants to digest starchy food, see an excellent paper in *The Practitioner* for September, 1872, by Dr. Prospero Sonsino, of Pisa, entitled, "On the Physiological Dyspepsia from Starchy Food in Infancy." The same views were long ago set forth by Mialhe in his "Chimie appliquée à la Physiologie et à la Thérapeutique," (page 51,) for he says, "Les enfants en bas âge ne digèrent que peu ou point les féculentes, parceque, avant la première dentition, l'insalivation est à peu près nulle."

BROMIDE OF POTASSIUM

IN TETANILLE AND OTHER CONVULSIVE DISEASES OF INFANCY AND CHILDHOOD.

I think no drug is a greater boon to infants than the bromide of potassium. I have specially mentioned tetanille, or tetany, because I know that some medical men speak of this as a very intractable or incurable disease. Whilst fully convinced that its true causes are usually to be sought in erroneous diet, or some other defect in hygiene, I certainly know no other remedy which so rapidly removes the symptoms as bromide of potassium does, given in full doses of three, five, ten, or even more grains, every three or four hours, according to age and the urgency of the case. In all convulsive diseases of children, bromide of potassium, with improved diet and cod-liver oil, is of immense service. One is not afraid of it as we are when using opium; though I may remark that the combination of a small dose of opium, in the convulsions of teething, and in the diarrhœa resulting from improper diet, is often extremely serviceable; such a mixture, for example, as five grains of bromide of potassium, a quarter or half a minim of tinct. opii., and a drachm of dill water or anise water, to be given three or four times daily, to an infant of twelve months whilst teething, often produces very marked relief to the symptoms of distress exhibited by the little patient.

MALARIA.

The more I see of the East of London, the more convinced I am that a very large number of the diseases which occur east of Temple Bar have a malarious type. My note-books contain many cases of ague, arising in patients who have never left London in their lives, and have not even been on the river. Some of the

newer districts about Dalston, Canonbury, Hackney Downs, and Clapton, where the houses are but lately built, have furnished very typical cases. The aguish cachexia, and even the enlargement of the spleen in ague, may be simulated by other diseases; but there is a sort of purple flush often seen on the faces of the sufferers, which, when once seen, is almost diagnostic of the source of the malady.

A NEW SIGN OF CARDIAC DILATATION.

Dilatation of the left ventricle of the heart may often be diagnosed before we examine the chest at all. There is a peculiar expression about the face, which some of those to whom I have shown it, have called a "flattening" of the features; this is not strictly correct, inasmuch as the features (those that depend upon the formation of the facial bones at least) may be the reverse of flat, but that is one's first impression. It is due to want of power in the facial muscles, which are weak, deficient in tone, and often flabby, so that only the most marked facial lines are present, all the finer lines, the *nuances* of expression are gone; yet there is no want of intelligence, the eye is bright, and the muscles, though weak, are generally still capable of expression, so that the face has none of the immobile and stolid look common in general paralysis or dementia. It is *want of power*, and not want of intellect, which is expressed by the muscles. It is best shown to students by shading the eyes of the patient. The explanation appears to me to lie in the fact that the facial muscles participate in the wasting and degeneration which affects the left ventricle; or, in other words, that the muscular fibres of the heart are undergoing a change and a loss of nutrition which is more or less shared by the muscles all over the body. When the right cavities of the heart are much dilated, there is more distress, more dyspnœa and lividity, and this condition has long been diagnosed by its facial signs; but the dilatation of the left cavities, particularly of the left ventricle, has not, so far as I know, attracted attention by its facial evidences.

PROLAPSUS ANI IN CHILDREN.

Most practical men will agree with me that those diseases which are on the border-land between (pure) Physic and (pure) Surgery are the worst cared for, and often the worst treated. They occupy a sort of "No man's land," and it is often fortunate for the patients that there is "a tendency to cure, or be cured," in the majority of

such cases. Prolapse or procidentia of the rectum in children is one of the cases in point. I presume the majority of cases at our large hospitals are under the care of surgeons, yet they very often come under the care of physicians, and I think justly, since in young subjects both operative and mechanical remedies are unnecessary, and, as regards the latter, useless. Over and over again I have seen the most complicated devices, often highly ingenious, made use of to retain the bowel in its place, and without success; whilst one great essential of treatment was left unregarded and undone, viz., the ensuring the complete *unloading of the bowels*. As long as the colon and small intestine are crammed with fæces, nothing will prevent the lower end of the rectum from becoming external in delicate children, especially if they are suffering from pertussis, or some other severe cough, or just convalescing from some exanthem. On the other hand, if the intestinal canal be kept free from fæcal distention, tonics administered; and some local astringents, such as the glycerine of tannin, a lotion of sulphate of iron, or of some zinc or lead salt, be used, there are very few cases which will not rapidly recover. Extreme degrees of ulceration, or partial strangulation of the protruded bowel, may occasionally require surgical interference, (the use of the actual cautery, of nitric acid, or perhaps even ligature,) but such cases are rare. I am sure that much harm is often done by the parent's or nurse's injudicious handling in endeavouring to return the bowel. If gentle pressure by a sponge, wet with cold water or the lotion, or by the fingers guarded by an oiled rag, will not reduce the prolapse, it is better to apply oil, or some appropriate lotion, and desist from all endeavours to return it. It will then often slip up by itself in a few hours, perhaps aided by the inspiratory efforts of the child, and perhaps still more by sleep allowing the sphincter ani and abdominal muscles to be more or less relaxed. I have seen the local use of ice succeed, but moist warmth is more agreeable to the little patients, and I think quite as successful.

BELL'S PARALYSIS.

Paralysis of the trunk of the portio dura on one side, generally known as facial or Bell's paralysis, is very commonly said to be rheumatic or catarrhal in character. No doubt it is so sometimes, and it has been known to come on suddenly after exposure to cold, when no other explanation of its ætiology could be admitted. In the majority of the non-traumatic cases I have seen, where no other

nerves participated, and the facial nerve was not affected before its exit from the stylo-mastoid foramen, the cause, when carefully investigated, has proved to be syphilitic adenitis, involving the lymphatic glands or the parotid, or syphilitic thickening of the muscles, fascia, and other connective tissue elements surrounding the nerve. The use of iodide of potassium and of counter-irritation in such cases is thus clearly indicated; and of all methods of counter-irritation, that by iodine, or the ointment of iodide of mercury, is the most efficacious. I can easily imagine that many will be loth to give up the idea of *rheumatism* in such cases. The word has a "comfortable sound," like Mesopotamia had to Mr. Whitfield's convert; but as regards paralysis, *this* is almost the last stronghold of the advocates of the rheumatic origin of such lesions, for M. Panas has lately shown that the so-called rheumatic paralysis of the extensor muscles of the forearm is due to compression of the musculo-spiral nerve, and is therefore mechanical in its nature.

PEDICULARIA CAPITIS WITHOUT PORRIGO.

Many children have what are called strumous glands in the neck, which give them a good deal of pain, and often suppurate. Finding no eruption, and no scabs on the hairy scalp, the true origin of the glandular swelling and tenderness is easily overlooked. Careful examination of the hair will generally reveal the ova of the pediculus capitis, or perhaps the pediculi themselves. These eggs of the common louse adhere with great pertinacity to the hairs, and the material by which they adhere, being of a resinous nature, can only be removed by the free use of soaps, alkalies, or spirit. A solution of soft soap in methylated spirit is a rapid mode of getting rid of them, but a good lather of soft soap and warm water allowed to remain in contact with the hair for ten minutes, and then rubbing the hair, not the head, with a rough towel, will soon effect what we want. The glands are best let alone, or, if that be thought inadvisable, white precipitate or dilute citrine ointment may be used for them and for the scalp also. It is often necessary to change the linings, or entirely destroy the caps or other coverings which the child has worn on the head.

PNEUMONIA EPHEMERALIS.

I remember, when a clinical clerk, being disbelieved and much ridiculed for reporting the physical signs of pneumonia, as having existed in a child thirty-six hours before the visit of the physician

in charge, the said signs having almost entirely disappeared in that time. Since I have been in practice, I have had several opportunities of verifying this early observation, or, to speak more accurately, of witnessing the rapidity with which pneumonia of the lobar type, or involving a whole lung, runs its course in children and young people. This is perhaps the reason why pneumonia is said to be so rare before puberty. I am not denying that it is rare compared with bronchitis and broncho-pneumonia, or "capillary bronchitis," but I wish to call special attention to the extreme speed with which the stages of congestion, red-hepatization, and resolution are, not run, but raced through, in many young people; so that if we do not examine the lungs at one visit, our next call may find the symptoms have almost or quite disappeared. Is it necessary to say that such cases do not require tinkering by any active medication? But they certainly deserve notice, because they furnish indications for caution in regard to such patients, and may throw light upon subsequent attacks. I take it as an axiom, that a lung which has once undergone so severe a process, even though recovery be thus rapid, and apparently complete, is never equally good with a lung which has never been so affected.

ON MECHANICAL DYSPNŒA AS A CAUSE OF DEATH.

Whilst nearly all our best medical writers have diligently inculcated all possible means of saving the strength of the sufferers from asthenic diseases, Dr. Inman, of Liverpool, is almost the only writer who distinctly avers that the want of muscular power to breathe is the true cause of death in many cases of croup, diphtheria, and allied diseases. That this is really so in many patients must, I think, be evident to almost any unprejudiced clinical observer.

It is quite true that it is sometimes difficult to say whether the want of power, the failure to act regularly or rhythmically, be actually in the muscles themselves, or in the nervous centres which initiate and control their action. But that death seldom happens (except from violence, or poisonous gases, and the like) from true suffocation must, I think, be sufficiently clear to any one who will call to mind how long life has been preserved in cases of cyanosis, with congenital stenosis of the pulmonary artery; in cases of double pneumonia, involving nearly the whole of both lungs; in patients who have large pleuritic effusions; and still more by remembering the great extent to which both lungs may be diseased for long

periods of time, as clearly shown by post-mortems. Further, in croup, diphtheria, and malignant scarlatina, measles, and similar anginose affections, there is very seldom indeed, complete stoppage of the air passages.

But all these complaints, and indeed I think I may say all fevers, have this in common, so far as regards their early stages: they accelerate respiration. Now, quickened respiration is imperfect and shallow respiration; and it would appear that this involves a diminished excretion of carbon dioxide. Hence it may be objected, "Here is the true cause of death! These are cases of poisoning by carbonic acid!" I cannot think so. I have known human beings to live in an atmosphere so impregnated with this gas as to kill small birds and animals, and although it is alleged that these die rather from other matters, (albuminoid and other ammoniacal compounds, or amines rather,) yet this is not against my view of the case, inasmuch as Drs. Angus Smith and Tidy show that very large per-centages of carbonic acid gas can be tolerated by both birds and mammals, especially if the dose be gradually increased. But explain it as we may, there is the clinical fact that weakly children, and delicate persons of both sexes at all ages, particularly at very young and very advanced ages, do die, in many complaints, apparently *not* because the heart beats feebly or not at all, but because respiration becomes more and more feeble, and shallow, and imperfect. Lastly, in many of these cases, there are no other indications of lesions of the medulla oblongata or spinal cord,—I mean no other recognized symptoms, such as hiccup, vomiting, very slow or intermittent pulse, convulsive movements, notable (sudden) changes of temperature, flushings, or the like,—but the death is that slow, solemn, painful death, which we call death by asthenia; sometimes even in cases of true croup, as Dr. Inman points out; often enough in other maladies. What can we do to save or husband this respiratory power of muscles? Little enough, I fear, in many cases, yet one or two things, especially in practice amongst the poor, may be impressed upon those who have the care of such cases:—As (1) to enjoin absolute rest, in bed, at an early period of the attack, in all cases of severe disorders of the respiratory passages or organs. (2) To enjoin abstinence from talking as regards the patients. (3) To secure sleep as regularly as possible. (4) To keep the air they breathe as pure and unirritating as we can. (5) To prevent the slightest constriction of the thorax by a mass of superincumbent clothing. It is known that the pressure of a pillow

will suffocate some infants, and I have seen respirations of the Stokes-Cheyne type instantly relieved by getting rid of the incubus of a heap of blankets, shawls, and quilts. (6) The avoidance of undue depletory measures, and the regular taking of a nutritious, but not bulky, and not easily putrescible, diet. These are suggestions which will occur to the mind of almost every thoughtful practitioner. An easy position in bed, and occasional changes of posture, are also measures which will give some rest, and some aid to the tired muscles. Small as these suggestions may seem, I am not without hope, that, as we have medicines which affect special regions, (some the spinal cord, some the fifth nerve, as croton-chloral is said to do,) so we may some day find a means of not merely stimulating, but directly strengthening and aiding, the muscles of respiration, as well as other muscles.

ON RHEUMATOID ARTHRITIS.

(ARTHRITIS DEFORMANS.)

Few practitioners will deny that the treatment of this disease is highly unsatisfactory, at least to the poor patients. The reason seems to me to lie not only in the essential peculiarities of the complaint, *i.e.*, in its morbid anatomy, or pathology, but equally, or perhaps even more, in the fact, that we very seldom have a pure and unmixed case of the kind to treat. A great variety of morbid affections are confounded together under this name; and sufferers from true rheumatic gout, which it has been well said is neither gout nor rheumatism, often suffer from complications, more than from the true disease. No doubt many who read this, will smile at my presumption in thinking that they could so easily fall into errors of diagnosis, or mistake complications which in many cases are patent. But I pray them patience. I have known very eminent men fall into mistakes, and if ever such were pardonable, it is in the case before us. For as regards the *deformity*, we have true gout, true rheumatism, obscure spinal diseases, progressive scleriasis affecting the fasciæ and tendons, syphilis, and perhaps other diseases, all producing deformities not so unlike the true disease, though all more or less differing from it. Then as regards the *pain*, besides the diseases mentioned above, we have renal affections, and progressive muscular atrophy, and locomotor ataxy, all giving rise to severe pains; and we have other joint affections, besides those of chronic synovitis, or eburnation of

the ends of bones, and ulceration of cartilages. We must also add malacosteon, and fragilitas ossium, and some forms of cancer and enchondroma, to our list.

Hence the varying and doubtful success of different plans of treatment. A case complicated by syphilis or truly syphilitic is relieved by iodide of potassium; a gouty case by the alkalies, colchicum, and opiates, and a great many are relieved by quinine and cod liver oil, and dry warmth. It is, I feel sure, a great mistake to suppose that arthritis deformans is limited to any class, sex, or age. It is, however, chiefly met with, according to my experience, (except where hereditary,) in those who live or have lived in damp and low-lying situations, or have been exposed to damp cold, or have had occasion to keep their hands frequently wetted. I know one case in which changing from a well-ventilated and comparatively dry mine, to another which was always damp and ill-aired, appeared to be the exciting cause. Many more in which occupations requiring frequent wetting or washing of the hands, seemed to be the inducing agencies. Thanks to Dr. Adams and Mr. Hutchinson, we know the post-mortem appearances fairly well, but we want the clinical history, and the hereditary transmission of the disease, and its *chemistry*, better worked out. I have not had time to pursue the enquiry as to the remarkable excess of ammonia in the urine, which Dr. Tidy and I found in some cases, so as to establish it as a general law; but Dr. Tidy has found, and I can fully confirm him, that these patients exhale a great deal of ammonia in their breath also, and have (in many cases, at least) a great deal of tartar on their teeth. Perhaps this may be one reason why the use of dilute acids and of quinine is so often useful. To pursue the chemical bearings of the subject would lead me much too far. They suggest reasons for the calcareous deposits; they hint to us of amines, and of strange compounds in this branch of vital organic chemistry; of theories of hyper- and hyp-oxidation, which I will not inflict upon the reader until the theories have at least some very solid basis of fact underlying them. I cannot conclude this paragraph, however, without bearing my testimony to the happy effect of the continuous current in several cases of chronic nodular arthritis.

SCRIVENER'S PALSY.

Whilst fully agreeing with those who believe that "writer's cramp" is a name very loosely given to a variety of affections with

the common symptom of dysgraphia or dyscinesia, I wish to record the fact, without claiming any originality of idea in the matter, that slighter degrees are often relieved by avoiding contact with the metallic portions of the penholder (a wooden or porcupine-quill penholder thus held is not so very different from a goose-quill as regards the conduction of heat, and perhaps electricity). Attention also to the height of the desk or table, and stool or other seat, and even to the nature and position of studs, buttons, or sleeve links, all trifles as it may seem, may often ward off symptoms which are very distressing to those whose bread mainly depends upon scribbling. I will never believe that mere writing will bring it on, apart from some muscular, nervous, or mechanical defect, although, of course, any set of muscles may be temporarily fatigued, or even worn out.

I have had a strong suspicion in some of the cases I have seen, that alcoholism had a good deal to do with the loss of power. Other cases of mine have been from nodes, saturnine intoxication, neuromata, progressive muscular atrophy, spinal and cerebral paralysis, and other causes sufficiently patent on careful examination.

THE PROGNOSIS IN CASES OF ALBUMINURIA.

On seeing urine almost solid with albumen, the majority, not only of students, but of practitioners, consider the patient's case as almost hopeless and irremediable. And no doubt such cases are generally extremely severe, and the drain from the system is a very exhausting one, and may cause marasmus in a very striking manner. Yet after watching many such cases, I would say that, *cæteris paribus*, they often do better, in the long run, if proper treatment be adopted, than those where there is just a slight film of albumen in the urine for weeks or months together. And the worst cases of all that I know, are cases of *renal disease without albuminuria*. A persistently low specific gravity, or persistent increase of water, or deficiency of urea, are generally to be regarded as very dangerous. Dr. Ramskill told me some years ago, that nearly all cases of diabetes insipidus die rather suddenly, and I have found this to be true in several cases. One very striking one I will narrate, as it formed the subject of an inquest, and some strong remarks were made by some of those unacquainted with the true facts. A young woman was for some weeks an out-patient, with apparently no other malady than the passage of very large quantities of urine of very low specific gravity (six to eight or ten

quarts, of specific gravity 1·002 to 1·004). There was no particular thirst, and no notable symptoms of cerebral disease. For a slight sprain she was made an in-patient of the hospital. This soon got well, and she was discharged as cured, but died suddenly on the very threshold of the hospital as she was leaving it. I believe the autopsy threw but little light on the cause of death, but my impression is that the fourth ventricle, medulla oblongata, and sympathetic nerves were not examined, as the surgeon who had charge of the case did not know her previous history, and never had his attention called to this part of the case.

Whilst speaking of urinary disorders, I may mention that a large number of the cases of true diabetes mellitus, of which I have cognizance, have died, sooner or later, of cerebral disease of some kind or other, or of coma at all events, and not from phthisis, or any allied diseases of the lungs, which are often said to be, and no doubt are, in many cases, the mode of death.

OF THE PHOSPHATIC DIATHESIS.

I am a firm believer in *diatheses*, or perhaps I should rather say, in the belief in certain typical forms of bodily constitution, with proclivities toward certain maladies of both body and mind. Not to be so, would, in my opinion, be a mental defect at least as serious in its way as colour-blindness. I have not, however, been able as yet to satisfy myself that there is really and truly a phosphatic diathesis. As regards the gouty or uric acid diathesis, I feel no hesitation, but I have not been fortunate enough to get an unmistakable type of the patient who is prone to phosphates, rather than to other urinary deposits. Of course our notions of urinary pathology are a good deal altered since this phrase first came into vogue. We know more (little as that may be) of the varieties of phosphates, and we are sure that in some cases a clear limpid urine may contain as much or more phosphorus than a very turbid, chalky looking, or iridescent fluid. We are cognizant of the influence of local conditions, such as cystitis, upon the amount of triple or ammoniacal phosphates present, and we are thus led to distrust the mere rough and ready estimation of phosphates by a rapid glance at the chamber or vessel containing the urine. But granting all this, and the further fact that the patients who furnish us with the so-called phosphatic urine at one time, will bring us urine loaded with oxalates, or it may be uric

acid, at another, we still have a tolerably definite group of nervous symptoms of the hypochondriacal type associated with a very large quantity of triple phosphates in the urine. I know a gentleman whose urine is always milky from this cause; a single drop of the water placed under the microscope shows crystals of this salt by the dozen—I had almost said by hundreds—for they lie crowded together in the field of the objective. This condition has lasted for some years with him. During the last summer I had a larger number than usual of such cases; a wet season more or less prevented the elimination of ammonia in other forms, and some of these cases subsequently had symptoms of uric acid calculi in one or the other ureter. The dread of death, and the nervous irritability of these patients during the phosphaturia, were very painful to witness, and required moral treatment almost as much as physical. The appetite in these cases was good, or even excessive, pulse, respirations, and temperature normal; and muscular power fairly developed, for it must be borne in mind that most of these patients pursued sedentary occupations, the list including clergymen, authors, gentlemen leading a quiet and monotonous life, and not fond of field sports or athletic exercises, clerks, shopkeepers, ladies much given to reading, and women of sedentary habits amongst the poorer classes. Many of them had morbid conscientiousness, but hardly any of them had any history of pronounced mental disease in their family.

One feature was common to almost all the cases: *the bowels were constipated.* Securing proper evacuation of the alimentary canal did more for these patients than any tonics, or any other treatment.

I was also sure in many cases, and strongly suspected in the residue, that, although not intemperate in the ordinary sense of the word, a great many of these patients habitually took a large quantity of alcoholic stimulants, under the impression that they needed them because of weakness; in other words, as Hood so well puts it,—

> "They took to taking spirits down,
> To keep their spirits up."

I should be sorry to be misunderstood, or that any one should imagine that limiting the supplies, and clearing out the bowels, were a panacea for the cases indicated. I hold that every case must have its own appropriate treatment, and requires careful study by itself. But I do say that careful attention to the bowels, to exercise, to diet generally, and to the condition of the skin, often

works wonders in these cases, and the addition of small doses of opium to the purges or tonics, is often of very great benefit, and a great comfort to the patients.

As tonics, I think quinine and iron are generally better than merely *acids*. I find *alkalies* often suit these patients best, a fact which I think Dr. Owen Rees was the first to point out, in his Lettsomian lectures; this is probably to be explained by many of these patients having gouty proclivities.

It seems to me that just as we were in error when we talked of respiration being performed in the lungs only, so we are equally wrong in considering digestion to be the function of the alimentary canal only. Digestion is being carried on, in the true sense of the word, wherever there are blood vessels, lymphatics, and nerves.

NEUENAHR:

ITS MINERAL WATERS AND ITS CLIMATE.

By Leonard W. Sedgwick, M.D.,

A Vice-President of the Association.

During my autumn holiday of 1872 I stayed a few days at Neuenahr, and had the good fortune to become acquainted with Dr. Richard Schmitz, the resident physician. In the course of an interesting and instructive conversation, I learned that he had great faith in the value of the Neuenahr waters in the treatment of diabetes, and I asked him to be good enough to allow me to be the means of communicating his opinions to his English brethren. The result is the paper which follows this, part of which I had the pleasure of reading before the Medical Society of London. As an introduction, I have thought that a short notice of Neuenahr might be useful.

THE AHR VALLEY.

Among the north-eastern slopes of that wonderful volcanic mountain region, the Eifel, which lies between the Ardennes and the angle formed by the junction of the Mosel with the Rhine, rises the river Ahr, which falls into the Rhine near Sinzig, about halfway between Coblenz and Bonn. The river runs a course of fifty-four miles, and at about ten miles from its mouth stands the little town of Neuenahr with its baths.

The route from England is easy; an eight miles drive from Remagen, a steamboat station on the Rhine, and also a station on the Rhenish railway between Bonn and Coblenz. The road is good, but the scenery is uninteresting. The wide plain is well cultivated, mainly potato growing, and the low hills which bound it are not adorned by the infrequent vineyards. Long before Neuenahr is

reached, the most striking object of the lower valley, the Landskron, a conical hill of columnar basalt, 911 feet high, is seen.

Near to it is passed the village of HEPPINGEN, where there are springs of weak carbonated alkaline waters; one of which, when further aerated, is known in England as APPOLINARIS water.

NEUENAHR lies on both banks of the Ahr, but the mineral waters spring on the right bank, where also stand the Kur Hotel, the Mariensprudel Hotel, and many lodgings. At the back of the town rises a long wooded height, 1,000 feet high, on which stand the ruins of a castle, formerly the seat of the Counts of Neuenahr, great knight robbers; the castle was destroyed by the citizens of Ahrweiler and the Archbishop of Cologne in 1328. On the opposite side, at about a mile distant to the northward, the valley is protected by a low range of hill slopes. Beyond Neuenahr for two miles the valley is wide and flat, until a picturesque old walled town, with a fine gate tower, AHRWEILER, is passed, and shortly afterwards the most beautiful part of the river's course is reached. For seven miles, as far as ALTENAHR, a narrow winding valley is traversed, through which the river flows, bounded on each side by walls and crags of black slate, which at times approach so near each other as to form a ravine. Here, on the right of the road, among the jagged rocks, wherever man can set a foot and the sun can warm, is grown a grape from which is made a dark purple-red full-bodied wine, Walportzheimer, which, when I drank it at Caspari's hotel at Altenahr, struck me as a wholesome, generous, well-flavoured liquor. On the left is the river, and beyond it wooded heights clothed with fir and beech, save where the trees are thrust aside by black rocks. At Altenahr the beauty of the Ahr-thal culminates, and the view from the road of the rugged peaks and wooded ridges is most striking. Even more beautiful is the view from above; the winding river, the wild dark rocks, tossed up in endless confusion, the many tinted trees, here in bright sunlight, there in black shadow, are things to be remembered, but not to be described.

NEUENAHR.

The part of the Ahr valley in which the village of Neuenahr is situated, is nearly a mile broad; on the north are low hills with vineyards, on the south are wooded heights. The village lies

chiefly on the left bank of the river, which is crossed by a handsome iron bridge. On the right bank are the springs and the chief hotels. Very pretty pleasure grounds, with many shady walks, stretch for a mile or more along the banks of the river, affording a pleasant stroll for those unable or unwilling to walk further. In Dr. Macpherson's valuable book, "*The Baths and Wells of Europe*," he says of Neuenahr, "For the present it wants shade." This must have been written some years ago. The baths were erected and the grounds laid out in 1858: and in 1872, when I was there, the trees had made such good growth that this objection was no longer valid; the many walks were shady and cool. At the Kur Hotel, where I stayed, the food was good, the rooms clean, and the charges not excessive. The bath rooms are airy and convenient, and well fitted with the different necessary appliances.

During the season there is Divine Service for the English in the Kur Hotel. A site has already been acquired for an English Church, and it is hoped that the necessary funds for its erection will soon be raised.

THE CLIMATE.

Neuenahr is very healthy, very dry, and has a remarkably even temperature. It stands on a gravelly soil, in a broad valley where it catches the first and the last sunbeam, and the air is pure and refreshing.

Wind.—There is always a wind at Neuenahr, but from the position of the town, with protection on the north by vine-covered hills, and on the south by wooded heights, it is usually warm. In addition, the tortuous rocky defile below Altenahr closes the valley on the west, and there are no side valleys by which eddies and cold currents may be produced. During the spring and summer the wind is usually from the south-west or south, and, coming over great woodland districts, is pure and refreshing, but never cold. The wind from the west and north-west is high and cold, but is fortunately in summer by no means frequent; it usually occurs after a heavy thunderstorm. Wind from the east or north-east is very rare.

Weather.—The following table is based upon observations conducted during the ten years from 1864 to 1873 inclusive, and shows the average number of days on which mist, rain, and thunder

occurred in each year. The removal of the decimal point of course shows the total number of occurrences in the ten years referred to.

WEATHER TABLE.

Month.	Number of days on which there occurred		
	Mist.	Rain.	Thunderstorm.
May . . .	·7	6·3	1·0
June . . .	·9	8·1	1·1
July . . .	·6	6·2	2·2
August . .	1·5	1·1	1·0
September .	2·7	6·0	1·2
Total . .	6·4	27·7	6·5

The most fog occurred in September, the least in May; the most rain in June, the least in August; the most thunder in July, the least in May and June.

Barometer.—The medium height during the last five seasons was 771 millimetres, or 30·355 inches.

The following table shows the highest and lowest day temperatures in the shade during the last four years.

DAY TEMPERATURE IN SHADE.

Highest.		Lowest.		Highest.		Lowest.	
Date.	Deg. Fah.	Date.	Deg. Fah.	Date.	Deg. Fah.	Date.	Deg. Fah.
1870		1870		1872		1872	
May 20	86	May 2	40	May 29	73	May 13	46
June 17	88	June 25	51	June 17	81	June 5	51
July 13	87	July 2	55	July 28	93	July 18	57
Aug. 3	83	Aug. 30	51	Aug. 22	76	Aug. 18	55
Sept. 6	72	Sept. 23	43	Sept. 4	81	Sept. 23	43
1871		1871		1873		1873	
May 26	79	May 18	41	May 25	72	May 16	42
June 17	84	June 5	44	June 22	84	June 2	49
July 18	86	July 11	57	July 23	91	July 1	54
Aug. 14	87	Aug. 29	55	Aug. 19	87	Aug. 14	55
Sept. 2	83	Sept. 20	44	Sept. 10	74	Sept. 23	47

MINERAL WATERS.

The waters of Neuenahr are warm, mildly alkaline, and contain a considerable quantity of carbonic acid. There are four springs, which vary in temperature. The Grosse Sprudel has a temperature of 40° C. (104° Fah.); the others have temperatures of 32°·5 C. (90°·5 Fah.), 30° C. (86° Fah.), and 22°·5 C. (72°·5 Fah.)

The constituents of the Grosse Sprudel in 10,000 parts of water, according to Professor Mohr, of Bonn, are as follows:—

Sodium Bicarbonate	10·5000
Magnesium Bicarbonate	4·3735
Calcium Bicarbonate	3·0240
Sodium Chloride	1·1250
Sodium Sulphate	·9074
Ferrous Oxide, with Aluminic Oxide	·1900
Silicic Oxide	·2430
Potash	·2813
Lithia	·0018
Free Carbonic Acid	2·8276

The amount of free carbonic acid is very considerable: the proportion being very nearly fifty per cent of volume in the Grosse Sprudel.

This analysis has been recently made, and shows a greater proportion of alkali than that previously published.

The water is bright and sparkling, and has, in addition to the saline taste, a flavour of iron.

THERAPEUTICAL PROPERTIES.

The following clinical remarks are a summary of the opinions of Dr. Richard Schmitz, partly contained in a paper in the "*Berliner Klinischen Wochenschrift*" for 1872, and partly contained in a letter with which he has recently favoured me.

After the drinking of the water the heart and pulse beat is considerably augmented, diuresis and diaphoresis are importantly increased. A pleasant sense of warmth is felt in the stomach, to which soon follows increased appetite; nausea and acidity decrease, and in no long time disappear. The action on the bowels is at first often constipating, but persistence in the use of the waters, or the addition of Carlsbad salt or Friedrichshalle water, soon restores the natural action of the bowels. In bronchial catarrh, with copious secretion, the expectoration is lessened. The action of the water varies with the

constitution of the patient. While torpid lymphatic persons, with slow circulation and flabby structures, are stimulated and strengthened, the nervous and sensitive become restless and sleepless.

GENERAL CONTRA-INDICATIONS AND INDICATIONS.

Contra-indications.—The following classes of cases are eminently unfitted for treatment at Neuenahr.

(1) Diseases of the heart, and congestions resulting therefrom.

(2) Vascular excitement; inclination to cerebral or pulmonary congestion or hæmorrhage.

(3) Great debility, with much vascular and nervous irritability.

(4) Acute inflammatory conditions.

Indications.—In the following conditions there is every prospect of benefit.

(1) In chronic catarrh of mucous membrane, especially where there is profuse secretion and atony.

(2) Where it is sought to increase the quantity of urine and perspiration, and to promote the activity of molecular change without deteriorating the blood and humours.

(3) Where excessive acidity has to be neutralized, and where it is sought to dissolve and to eliminate morbid deposits and exudations.

Thus the waters may be very usefully employed in diseases of the respiratory, urinary, digestive, and genital organs, and in gout and rheumatism.

SPECIAL CONTRA-INDICATIONS AND INDICATIONS.

CHRONIC CATARRH OF STOMACH.

By the use of the waters the tendency to vomit is diminished, and by persistence removed, whilst the abnormal secretion of mucus is restrained, and the irritability of the nerves of the stomach is soothed. The appetite is strengthened, acidity is neutralized, and its re-formation hindered. The secretion of the gastric juice is promoted, the enfeebled muscular coat of stomach and intestines is strengthened, and stimulated to greater activity.

On the other hand, the following cases are unfitted for treatment at Neuenahr.

Patients who complain of painful sensations in the neighbourhood of the stomach, which are increased by pressure or food. Patients who suffer from habitual constipation; in them a more

active water is needed. Patients who suffer from great flatulence and abnormal development of gas. In regard to constipation, it must be noted, however, that if it be produced after the drinking of the waters, and is less dependent on venous stasis or thickening of intestinal mucous membrane than on deficient innervation and defective muscular tone, the continued use of the water will be beneficial.

These last conditions being absent, the waters will be useful when the chronic stomach catarrh is the result of an acute attack, or has been caused by excessive drinking, eating, or smoking; when it follows in the train of gout, chronic diseases of the lungs, uterine disease, chlorosis, Bright's disease, liver disease, or typhoid fever; and when dyspepsia is the result of deficient secretion of gastric juice.

CHRONIC INTESTINAL CATARRH.

Dr. Richard Schmitz has the highest opinion of the use of Neuenahr water in chronic diarrhœa even of the longest standing, and he confidently looks for cure in all cases except those where the disease is accompanied by fœcal accumulation; where cancerous or tuberculous ulcers are present; where tenesmus and bloody evacuations denote the existence of follicular ulceration.

GALLSTONES.

A great number of patients suffering from gallstones have come under Dr. Richard Schmitz's observation, and he is of opinion that, by the use of the waters, stones are dissolved and passed with less pain, and that the after-results have been good, inasmuch as by the consequent improvement in digestion the re-formation of the concretions has been prevented. Especially does he recommend Neuenahr for its tonic action in enfeebled conditions, where the use of the strong alkaline saline mineral waters would be injudicious. Good results have also followed in chronic catarrh of the gall ducts.

CHRONIC BRIGHT'S DISEASE.

Many cases have been treated at Neuenahr with great advantage to the dropsical symptoms; the benefit has been very notable in cases where there was also catarrh of the gastric or bronchial mucous membrane. The general contra-indications noted above should always be carefully considered.

URINARY DEPOSITS.

Uric acid concretions, whether of kidney or bladder, are greatly benefited. Dr. Richard Schmitz has seen a great number of cases in which complete cure was obtained, not only in the removal of deposits, but, by a repetition of the treatment, their re-formation has been prevented. Consequent catarrhal affections of the bladder are much relieved. Only those persons are to be excluded who suffer from inflammatory conditions of the kidney, or when great obesity and enlargement of liver demand more resolvent and purgative waters, such as those of Tarasp or Carlsbad. Dr. Richard Schmitz has no experience of the use of the water in phosphatic concretions. In oxaluria he does not recommend Neuenahr ; indeed in five such cases he has seen very bad effects from drinking the water.

CHRONIC METRITIS.

Dr. Schmitz does not advise the Neuenahr cure when with chronic metritis there is distinct uterine tenderness, or great irritability, or very copious menstruation. But in torpid conditions relief may be expected, and even the more certainly the more irregular and sparing the menstruation. Concomitant non-malignant thickening, especially of the cervix uteri, is often resolved.

Leucorrhœal discharges in lymphatic and chlorotic persons are greatly benefited.

DIABETES MELLITUS.

The presence of alkalies and iron rendered it probable that the use of Neuenahr water in this disease would be advantageous, and experience has confirmed this supposition. In 1866, Dr. Hünseler in his inaugural dissertation furnished proof that of all modes of treatment of diabetes adopted in the Medical Clinic in Bonn, that with Neuenahr water furnished the most favourable results. The first case under Dr. Richard Schmitz's observation occurred in the summer of 1868, and the remarkably satisfactory results were reported in the "*Berliner Klinischen Wochenschrift*" for 1869. Dr. Richard Schmitz looks upon Neuenahr water as almost a specific in diabetes, always provided that a fitting diet is adopted ; and he is of opinion that the Neuenahr water is preferable to all other mineral waters from its strengthening and tonic action. He has several times ordered its use in diabetes for periods of eight or ten months in duration, and has never seen any unsatisfactory results from so long

a continuance. Only those cases should be excluded where the previously noted contra-indications exist, where the disease is in the last stage, and where there is important infiltration of the lungs.

The statistics of the treatment of diabetes under Dr. Richard Schmitz's care at Neuenahr for the four years ending 1872, will be found in the succeeding paper.

The records of the last season, 1873, are very favourable. Dr. Richard Schmitz has had under his care thirty-nine cases of diabetes; of these, thirty-two visited Neuenahr for the first time, and the other seven had been there before. Of the thirty-two cases, fifteen completely lost all sign of the disease; fourteen others were so much benefited that the sugar was reduced to a per-centage of ·3 to ·5, and the general symptoms had entirely disappeared; the remaining three cases were in no degree benefited, but all were in the last stage of phthisis, in one case complicated with stenosis of the mitral valve; one of these patients died. Of the seven patients who had been at Neuenahr before, six entirely lost all symptoms of diabetes; and the seventh was so much improved in ten days, the sugar having been reduced from 4·5 to ·5 per cent, that he considered himself perfectly cured, and left.

GOUT.

Dr. Schmitz lays great stress on the tonic influence of the Neuenahr waters, whereby the persistent action of the alkali is not accompanied with any debilitating result, and so patients are enabled to continue their use for a longer period. In general, these waters are not to be recommended in acute attacks in strong persons; but rather in the intervals of repeated attacks, when the system has been weakened; and where anomalous conditions of a gouty character are co-existent with catarrhal conditions of bronchi, stomach, or bladder, or with uric acid deposits. When there are indications of arterial mischief in heart or brain, Neuenahr is not to be recommended.

CHRONIC RHEUMATISM.

In all cases, except very feeble, very excitable, and nervous individuals.

CHRONIC LARYNGITIS.

Syphilitic and tuberculous cases are unsuitable, as also cases in which there is ulceration of mucous follicles; or in which the inflammatory conditions are acute or liable to become so.

The cases fit for treatment here are those which, originating in an acute attack, or from scrofulous inclinations, or produced by excessive use of the organ, or by smoking, or by drinking, present a thickened, granular, relaxed, mucous membrane.

CHRONIC BRONCHITIS.

The general contra-indications noted above are here specially to be considered. In their absence, and when there is free bronchial secretion and atony of mucous membrane, Neuenahr may be highly recommended, whether the disease have arisen out of an acute attack, or from excessive drinking or smoking, or from the inhalation of flour or dust of any kind; whether it be a complication of emphysema (always provided that the expectoration is free and muco-purulent) or dilation of bronchi; or whether it be a phase of abnormal gout or scrofula. Much relief may also be confidently expected in those cases of chronic bronchitis which have their chief origin in kidney or liver disease.

CONSOLIDATION OF LUNG.

When the deposit is not tubercular, Neuenahr is of great service; and also in pleuritic effusions.

TUBERCULAR PHTHISIS.

Dr. Richard Schmitz strongly warns the tubercular, especially those liable to hæmoptysis, not to go to Neuenahr, and urges the necessity of a very careful diagnosis, that a person in whom the tubercular diathesis is latent may not be ordered to drink the waters as a mere chlorotic patient.

THE TREATMENT OF DIABETES AT NEUENAHR.

A REPORT OF FIVE CASES, WITH SOME REMARKS ON THE PATHOGENESIS OF THE DISEASE.

By Richard Schmitz, M.D.,
Resident Physician at Neuenahr.

Case I.—Mr. V., sixty-two years of age, born of healthy parents, had always enjoyed good health, with the exception now and then of a slight bronchial catarrh from cold, and had endured an extremely strained mental activity for many years. In the spring of the year 1868, Mr. V. observed for the first time that he did not feel as much inclined to work as formerly, and he moreover experienced a constantly increasing weariness and debility, with polyuria. A chemical analysis of the urine was immediately resolved upon, which proved beyond all doubt the presence of sugar, and induced Professor Bardeleben, of Berlin, and Professor Rühle, of Bonn, to send the patient to Neuenahr, where he arrived on the 16th of July, 1868. The patient, who had a slight lateral curvature of the spine, presented an extremely wan and apathetic appearance. His skin was very flabby and dry. The adipose tissue had almost entirely disappeared. The mucous membranes showed great anæmia. Temperature, normal. Pulse, 68 to 70, weak. Tongue, very dry, and much coated; very considerable fœtor ex ore; appetite middling, thirst very tormenting. Polyuria, especially at night time; a tendency to diarrhœa. Great debility and disinclination to work. The physical examination gave the following results. The upper part of the lungs quite healthy, behind and slightly on both sides large rhonchus; heart not enlarged; the sounds of the heart, weak, but clear; liver and spleen normal; weight of the body, 98 lbs. (Zollpfund.) Urine strikingly pale, faintly acid. The quantity of urine secreted in twenty-four hours amounted to the large quantity of 9,000 CC., 18 pints; specific gravity, 1·040; no albumen; quantity of sugar, 5·5 per cent.

Treatment.—Daily, nine 180-gram (five ounces) glasses of the Grosse Sprudel. This quantity was gradually increased, so that the patient, after three weeks, took five glasses in the morning before breakfast, six glasses at ten o'clock, and five glasses more at five o'clock in the evening. This enormous quantity of water did not, however, quench his thirst, but he drank on the average during the night a litre (1·76 pint) of cold Sprudel. The diet was what is usual in diabetes, only small quantities of bread being allowed at meals, but no other farinaceous food; the drink, in addition to the water, being good old claret.

The chemical analysis of the urine, made every seven days, but afterwards oftener, gave the following results.

CHEMICAL ANALYSIS OF URINE.

1868.	Specific Gravity.	Per cent. of Sugar.
July 24 . .	1·031	4·0
July 31 . .	1·020	3·0
Aug. 7 . .	1·017	1·8
,, 14 . .	1·018	1·0
,, 21 . .	1·015	0
,, 25 . .	1·012	0
,, 31 . .	1·014	0
Sept. 5 . .	1·013	0
,, 9 . .	1·011	0
,, 10 . .	1·014	0

After a treatment, therefore, which lasted scarcely thirty-eight days, the sugar had completely disappeared, for, after a most minute and careful analysis, not a single trace could be found. An exact determination of the quantity of urine secreted in twenty-four hours could not always be made, because the patient often forgot to preserve the urine for that purpose.

The quantity of urine secreted from the 7th to the 8th of September, toward the end of the treatment, was only 4,000 CC., notwithstanding the great quantity of Sprudel, so very exciting to the secretion of the kidneys, which the patient took daily; whilst, at the beginning of the treatment, as mentioned above, it had amounted to 9,000 CC. With the entire disappearance of the sugar a very marked change had taken place in the state of the general health of the patient. Thirst, weakness, shortness of breath, and indifference

had entirely disappeared. The patient, who felt himself getting stronger from day to day, appeared to be, and felt himself, again fit for mental exertion. He undertook the longest walks, and his strikingly changed and healthy appearance created much surprise amongst the other visitors. The weight of his body on the 8th of September was 113 lbs. (Zollpfund): it had therefore increased 13 lbs. (Zollpfund) in eight weeks.

Case II.—Mrs. K., thirty-seven years of age, born of very healthy parents, enjoyed good health until the winter of 1868. She kept house with great activity and assiduity. She had given birth to four children during a married life of fifteen years, one of which died very young of an illness which is considered by the patient to have been diabetes. Of the three children still living, two are perfectly healthy, whilst the other, the history of whose illness will be found further on, also became the subject of diabetes.

In the winter of 1868 Mrs. K. first observed that owing to a remarkable weakness and faintness she was no longer able to carry on her household concerns as formerly. She states, too, that at that time she already observed a greatly increased quantity of urine, and a strong feeling of hunger and thirst. Her condition was regarded as the consequence of births quickly following one another, great excitement, and exertions like those which the illness and death of her child had brought about; and rest, nourishing food, tonics, and nervines were prescribed for her.

All this, however, notwithstanding a winter sojourn in Nice, was of no use. The patient, therefore, consulted Professor Friedreich, of Heidelberg, at the beginning of July, 1871. He immediately recognised the case as one of diabetes, and sent her for treatment to Neuenahr, where she arrived on the 11th of July.

The patient was corpulent, had a pale yellow, bloated, and very apathetic looking face, and appeared to be extremely exhausted. Mucous membranes showed great anæmia; skin very dry; temperature not raised; pulse, 96, weak and thready; tongue dry, very much loaded; the characteristic fœtor ex ore. The patient complained particularly of great weakness, frequent swoons, and disinclination, as well as inability, to undertake the slightest bodily exertion, passing the greater part of the day in a recumbent position.

The patient suffers from excessive thirst, her appetite at present is not remarkably good; polyuria, especially at night time; great

inclination to diarrhœa; menses regular, but very scanty; impaired eyesight, and at times double vision.

The physical examination showed, in addition, the symptoms of an existing bronchial catarrh, brought on in consequence of taking cold; extremely weak and indistinct sounds of the heart and the great vessels; humming noises in the veins; and a slight enlargement of the left lobe of the liver. The weight of the body amounted to 153 lbs. (Zollpfund.)

The patient states that she has not of late years observed any loss of flesh. The quantity of the bright yellow, weakly acid re-acting urine, which was daily secreted, amounted to 4,500 CC.; specific gravity, 1·040; the quantity of sugar, 5·4 per cent; no albumen.

Treatment.—At first, six 180-gram glasses of Sprudel per day, and eight glasses daily afterwards; complete abstinence, as far as possible, from all food containing sugar or starch; small quantities of bread allowed; cold Sprudel and good Bordeaux wine.

20th July.—Quantity of urine daily secreted, 3,200 CC.; specific gravity, 1·038; quantity of sugar, 4·5 per cent. No important improvement in the state of the patient. Ordered to drink two glasses more per diem.

27th July.—An exact determination of the quantity of the twenty-four hours' urine has not been made; the quantity of sugar in the night's urine, 3·4 per cent; specific gravity, 1·032. The patient feels herself a little stronger, thirst diminished, tongue moister and less furred. Ordered to drink two more glasses daily.

3rd August.—The quantity of the daily secreted urine is 1,800 CC.; quantity of sugar, 2·0 per cent; specific gravity, 1·025. The patient is again enabled to take short walks.

11th August.—The daily secreted urine amounts to 1,500 CC.; quantity of sugar, 1·8 per cent; specific gravity, 1·023. State of the patient not materially changed.

18th August.—The daily secreted urine is 1,500 CC.; quantity of sugar, 1·0 per cent; specific gravity, 1·018. The patient is very satisfied with her state of health. The derangement of her sight has completely ceased. The tongue is quite moist and clear. No fœtor ex ore. Pulse, 78.

25th August.—No sugar; the daily secreted urine, 1,000 CC.; specific gravity, 1·011. General health, good. Pulse, 76, stronger.

8th September.—No sugar; specific gravity of the night's urine, 1·012. The patient feels herself quite well, takes long walks and excursions; and the skin acts again.

22nd September.—Specific gravity of the night's urine, 1·014; quantity of sugar, 0·4. Patient confesses that she had several times taken compotes and preserved fruits. Strict diet; twelve glasses of Sprudel daily.

29th September.—Daily secreted urine, 1·100 CC.; specific gravity, 1·010; no trace of sugar. State of health good.

2nd October.—Specific gravity of the night's urine, 1·011; no sugar. The patient leaves Neuenahr.

The patient has since sent to me, from time to time, urine for examination, as well as a report of the state of her health, and she also spent a few weeks of the summer of 1872 at Neuenahr. I am able, therefore, to give an accurate report up to the end of the year 1872, that is, one year and three months after the treatment at Neuenahr. After the most careful examination, only three times were any traces of sugar found in the urine; each time its presence was proved to be the direct consequence of continued and great faults of diet, and each time it immediately disappeared on resuming a stricter diet. The patient has also during this time been free from all subjective symptoms of diabetes.

Case III.—Miss L., nineteen years of age, always healthy till about four months ago, states that ever since she has been suffering from diabetes. She was sent to Neuenahr by Professor Rühle, of Bonn, for treatment, and arrived there on the 6th of July, 1871. The patient, who is of small thin figure, although her face is reddened in consequence of momentary excitement, appears very much exhausted and reduced upon close examination. The skin is withered and very dry. The adipose tissue has entirely disappeared. Tongue dry and very much furred; mucous membranes remarkably flabby, and showing great anæmia; very strong fœtor ex ore. Pulse very weak and thready, accelerated 100. Temperature not increased. The patient appears very much excited, and is very anxious about her health, stating that in the later months she has become strikingly weaker. Intense feeling of hunger and thirst. Polyuria, frequent diarrhœa, sour eructations from time to time, pains in the stomach and bowels. The menses have not appeared for two months.

The physical examination of the chest and abdominal organs was as follows. The somewhat distended epigastric region was painful on

pressure. Increased action of the heart; sounds of the heart and great vessels very weak and indistinct; systolic blowing at the apex of the heart, humming noises in the veins; otherwise nothing positive.

Weight of the body, 92 lbs. (Zollpfund). The urine secreted in twenty-four hours, amounting to 5,600 CC., was of a bright yellow colour, and weak acid re-action; its specific gravity was 1·042, and it contained 6·0 per cent of sugar, no albumen.

Treatment.—Owing to the great sensitiveness of the patient, only small quantities of the Grosse Sprudel, 120 grams three times a day, were at first given; a diet suitable for diabetes; cold Grosse Sprudel and good old claret were ordered to be drunk; no bread.

14th June.—Saccharine matter of the night's urine, 5·0 per cent; specific gravity, 1·038. Weight of body not increased, subjective symptoms not materially lessened. Seven 120-gram glasses daily.

21st June.—Daily secreted urine amounts to 3,600 CC.; specific gravity, 1·035; saccharine matter, 4·5 per cent. No material change in general health.

28th June.—Saccharine matter of the night's urine, 3·0 per cent; specific gravity, 1·030. The weight of the patient's body has increased by 1½ lbs. Thirst lessened; tongue cleaner and moister. Pulse, 80.

3rd July.—Patient suffers from diarrhœa; saccharine matter of the night's urine, 4·0 per cent; specific gravity, 1·033. Opium; water reduced to three glasses daily.

5th July.—As the diarrhœa has left her, the treatment is continued as formerly.

8th July.—Quantity of urine secreted in twenty-four hours, 2,000 CC.; specific gravity, 1·028; saccharine matter, 3·0 per cent.

15th July.—Quantity of urine in twenty-four hours, 1,800 CC.; specific gravity, 1·024; saccharine matter, 2·0 per cent. Patient feels considerably better, and her body has increased 1 lb. in weight. Tongue moist and tolerably clean. To drink eight 180-gram glasses of the water daily.

20th July.—Patient is very much excited, and complains of violent pains in the stomach and bowels. Pulse, 104. Diarrhœa. Specific gravity of the night's urine, 1·034. Saccharine matter, 3·5 per cent. Rest. Aq. amygdal., amar., and opium. Strict diet.

25th July.—Specific gravity of the night's urine, 1·024. Sac-

charine matter, 2·5 per cent. The diarrhœa and pains in the bowels have quito gone. Pulse less excited, only 80.

1st August.—Daily amount of urine, 1,500 CC.; specific gravity, 1·020; saccharine matter, 1·5 per cent. The patient feels very well, and the weight of her body has increased by 2 lbs. No thirst.

8th August.—Specific gravity of the night's urine, 1·013; no sugar. Fœtor ex ore completely disappeared. Tongue moist and clean. Weight of body has increased 2 lbs. Ten 180-gram glasses daily.

11th August.—Specific gravity of the night's urine, 1·017; saccharine matter, 1·0 per cent. Health good. No fœtor ex ore.

15th August.—No sugar; specific gravity of the night's urine, 1·012. Weight of body increased 2½ lbs. Menses have began again, and are tolerably abundant. Pulse, 76.

22nd August.—Specific gravity of the night's urine, 1·011; no sugar. An exact determination of the amount of urine secreted daily was now neglected by the patient; she maintains, however, that it materially lessened. No symptoms whatever of diabetes, but still those of the former gastro-intestinal catarrh. Pulse, 76 to 78, materially stronger. Skin performs its duty.

29th August.—No sugar; specific gravity of the night's urine, 1·012. Patient finds herself perfectly well, and leaves Neuenahr on the 30th of August, 1871.

From reports received from this patient up to the spring of 1872, it appears that she has remained perfectly free from all subjective and objective symptoms of diabetes.

Case IV.—Mr. T., of Finland, seventy-six years of age, born of healthy parents, and himself always healthy, says that during his life he has taken a great deal of sugar and saccharine food. When the symptoms of diabetes mellitus first appeared cannot be ascertained with any degree of certainty, as the patient is not very concise and clear in his statements. It appears, however, that the malady had been present a year and a half or two years. The patient arrived at Neuenahr on the 20th of July, 1871. His appearance did not give one the impression of a person afflicted with diabetes mellitus. His body seemed well nourished, and his complexion did not look at all like that of one ill. The skin dry. The adipose tissue developed in a very high degree. Tongue moderately dry, and a little coated. Some fœtor ex ore. Pulse,

weak, but otherwise normal, 68. Temperature normal. The patient complains especially of increasing debility, thirst, and hunger. Polyuria, and great inclination to diarrhœa; at the same time the discharges come so suddenly and quickly, and the sphincter of the anus appears so weak, that there is very often unintentional escape of the fæces. The weight of the patient's body amounts to 184 lbs. (Zollpfund), and he declares that he has not of late years observed any decrease in it. The physical examination showed nothing positive, except slight emphysema and a slight enlargement of the liver. Urine, bright yellow, weakly acid; daily quantity, 2,000 CC.; specific gravity, 1·030; saccharine matter, 3·0 per cent; no albumen.

Treatment.—Eight glasses of Grosse Sprudel daily; diet for diabetes, only small quantities of bread at meals; as drink, Bordeaux wine and cold Grosse Sprudel.

27th July.—Specific gravity of the night's urine, 1·026; saccharine matter, 2·0 per cent. Tongue moister.

4th August.—Specific gravity of the night's urine, 1·015; saccharine matter, 1·0 per cent. Less thirst. Patient feels stronger. Ten 200-gram glasses daily.

11th August.—Specific gravity of the night's urine, 1·012; no sugar. Patient is considerably stronger. No fœtor ex ore. Tongue moist and clear.

13th August.—Diarrhœa. Tongue much furred. Specific gravity of the night's urine, 1·018; saccharine matter, 1·2 per cent. Opium.

18th August.—Specific gravity of the night's urine, 1·014; no sugar. Diarrhœa disappeared. General health good. Skin acts properly. The patient states that the quantity of urine secreted in twenty-four hours had considerably diminished. An exact determination of its quantity could not, however, be made, as the patient always forgot to collect it. The patient leaves Neuenahr completely cured.

According to reports which I received in September 1872 from his physician, Dr. Hahe, of Abo, in Finland, the patient continued in the best health, and sugar had not again presented itself in the course of the year.

The favourable result of the treatment at Neuenahr, not only in the preceding four cases, but also in the whole number of diabetics treated there, may well be considered as a complete proof that the waters of Neuenahr are, in many cases of diabetes, really a specific

remedy. In the last four seasons, I have treated forty-three cases of diabetes in Neuenahr. Of these, twelve have resulted in cure; in twenty-one cases the saccharine matter was materially lessened by the use of the waters, and in some reduced even to a minimum. The subjective symptoms were in every case considerably diminished, whilst in some they had entirely disappeared; and a rigid adherence to the prescribed diet, and a longer course of treatment, would, I am certain, have brought about their entire removal in several other cases. In ten cases only were no satisfactory results obtained by the use of the waters of Neuenahr. Of these ten, three came in a dying state to Neuenahr; two discontinued the treatment after scarcely eight days; and in the remaining cases the disease had either entered its last stage, or was complicated with Bright's disease of the kidney, diseases of the heart, amyloid degeneration of the liver and kidneys, or advanced tuberculosis of the lungs, or had been brought on by incurable disease of the brain and the spinal marrow.

Case V.—T. K., at this time four years of age, a daughter of Mrs. K., the subject of Case II., is said never to have been seriously ill, although she is of a very weak and delicate appearance. Her father is still alive and healthy. As Mrs. K., however, had always feared that her disease might descend to her daughter, I made an examination of the child's urine from time to time, but invariably found it free from sugar.

On the 26th of November, 1871, the child became ill quite suddenly, with the following symptoms. Great exhaustion and debility, headache, a very dry, feverish, and furred tongue, great inclination to vomit, excessive thirst, the pulse very frequent, the temperature of the body considerably raised, amount of urine considerably diminished, constipation. All these symptoms led not only me, but also the physician, Dr. Herscheimer, of Wiesbaden, under whose care she was, to suppose that it was gastric fever. It was, therefore, only at the earnest wish of the anxious mother that I again examined the child's urine, as I had previously examined the night urine of the 22nd of November, which had been sent to me, and had found it perfectly free from sugar. The very dark-coloured and strongly acid urine showed a very considerable sediment of salts of uric acid, and had a specific gravity of 1·042; it was free from albumen, but contained 5·8 per cent of sugar. Dr. Sintenis, assistant of the University Laboratory of Bonn, also found saccharine matter

amounting to 5·6 per cent, agreeing very nearly with my own determination.

The child took immediately, besides small doses of sodium bicarbonate, good broth, roast meat, raw eggs, cheese, and curds mixed with a little sour cream, as her exclusive food. Bread, and all things containing saccharine or amylaceous substances, were strictly forbidden.

The night urine of the 3rd of December, examined by Dr. Herscheimer and a chemist in Wiesbaden, had a specific gravity of 1·038, and saccharine matter amounting to 3·5 per cent. The sediment still continues. Quantity of urine has not yet increased. Pulse normal. Temperature no longer increased. Tongue cleaner and moist. Headache and sickness have disappeared. The patient is still very weak.

The night urine of the 8th of December, which was also examined in Wiesbaden, contained 2·0 per cent of sugar, with a specific gravity of 1·035. Sediment still continues. General state of health materially better, a keener appetite, tongue moist and clean.

The night urine of the 13th December, sent to me on the 14th, contained no sugar whatever; its specific gravity amounted to 1·035; still very considerable sediment. This, as well as the strikingly high specific gravity, continued fourteen days longer. Sugar has not, however, presented itself up to the present time, although the urine has been very often examined. All the previously mentioned symptoms had been diminished in such a degree that the child was able to leave her bed on the 12th of December; she only felt very weak, and was remarkably thin. By the use of iron and cod-liver oil, however, and strict adherence to the diet ordered, she quickly recovered. Although no sugar has yet re-appeared, and the child is otherwise well, she still takes only small quantities of bread and milk, and no other food containing sugar or starch.

There is certainly no doubt, that, with reference to the foregoing case, so quick and perfect a cure of diabetes is only to be ascribed to the immediate adoption and observance of the above-mentioned diet in the first stage of the disease. An early and precise analysis of the urine, therefore, cannot be too strongly recommended in all cases of illness, since, as a matter of fact, most cases of diabetes mellitus are only recognised and treated as such after having long existed. I have related this case since it seemed to me particularly interesting as well from the suddenness of its appearance, as from

its undoubtedly hereditary character* and the very youthful age of the patient. Besides the great quantity of saccharine matter, no characteristic symptom of diabetes existed, but the disease rather made its appearance under the peculiar symptoms of gastric fever. All the symptoms of gastro-intestinal disturbance were diminished immediately after all saccharine and amylaceous food had been withheld, as much as possible, from the child, and a diet had been prescribed which certainly would not have been a suitable one in common gastric fever. The decrease of the symptoms, too, kept pace with the diminution of the saccharine secretion, so that when the latter had completely disappeared, nothing was to be discovered of the former either.

The illness which was erroneously considered at first to be gastric fever was solely caused by the accession of acute diabetes mellitus. As proof of the great probability of this assumption, I would quote verbatim a communication which has been made to me by eight patients suffering from diabetes mellitus: "They had at first fallen sick of a gastric fever, and from it the diabetes mellitus gradually developed itself."

Very remarkable, too, is the fact I have observed, that, of forty-three patients suffering from diabetes mellitus, (exclusive of the child,) all were more or less suffering from stomach and intestinal catarrhs (catarrhus gastro-intestinalis). Food composed almost exclusively of albuminous and fatty substances agreed very well with all, and the gastric inconveniences were diminished in every case when the amount of sugar became less, but were always augmented when, as was often the case, the saccharine matter in the urine was increased by taking greater quantities of bread. In those cases where due attention had been paid to diet, the gastric symptoms had disappeared simultaneously with the sugar.

These combined facts have led me to suppose that the original seat of diabetes mellitus is to be sought in the stomach and small intestine, or probably in the latter alone. It is well known, on the one hand, that, in normal conditions, and indeed with a food containing a large amount of saccharine matter, only very small quantities, barely traces, (0·5 per cent,) of sugar, are to be found in the blood of the vena portæ and in the chyle; whilst, on the other hand, repeated injections into the rectum of a liquid containing sugar (as, for instance, milk)

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* The mother has lately informed me that sugar has made its appearance in the urine of another child, aged fifteen years.

produces diabetes mellitus. It follows, then, from this, that absorption from the bowels does undoubtedly take place, but that as a small proportion only of saccharine matter is to be found in the blood and chyle, the quantity so absorbed must be exceedingly small, and corresponding in no degree whatever to the enormous quantities of sugar which are daily conveyed to the intestinal tract. The supposition may thus be considered as well grounded, that as the sugar must necessarily remain somewhere, it undergoes for the most part an entire and essential change, either immediately on its reception into the stomach, or, more probably, into the duodenum, and under the co-operation of the alkaline pancreatic juice.* How this process is brought about and carried on must be left to later researches, but that it does take place appears to me to be highly probable.

If, then, in consequence either of hereditary predisposition, or of irregularities of innervation or other pathological conditions, or of the quantities of sugar which may be introduced into the intestinal canal being too large to undergo a complete transformation and change, this sugar converting process is not accomplished at all, or is only carried on in an unsatisfactory manner, the quantity of sugar in the intestine must be more or less materially increased, especially if food containing sugar and starch be continually taken. Whilst therefore, one portion of the sugar thus collected and accumulated in the intestinal canal will be absorbed without difficulty, and so cause diabetes mellitus, (as shown in experiments proving the production of diabetes by absorption of the sugar of the milk injected into the rectum of dogs); another portion will remain in the canal, and, passing into a state of fermentation,† produce all the chronic and acute catarrhs of the stomach and bowels already referred to as accompanying diabetes mellitus.

All these catarrhs and disturbances of the digestive tract thus brought on by the process of fermentation are most notable in the beginning of the disease, whilst the usual general symptoms brought about by the diabetes mellitus itself appear to develope themselves but gradually. Such, in fact, was the case with the child and the eight

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* The pancreas of those who have died from diabetes mellitus is invariably found to be very much atrophied.

† The peculiar fœtor ex ore of those afflicted by diabetes, so like the sour alcoholic-smelling breath of drunkards, is unmistakable, and without doubt owes its origin to this very fact of fermentation.

other patients already mentioned. In proof of the probability of these suppositions, I would refer to the undeniable fact that a food as much as possible free from sugar,* and consisting of albuminous and fatty materials, is calculated very quickly to remove both those conditions, in every case where diabetes mellitus, and the catarrhs and disturbances of the digestive organs, have arisen through the excessive introduction of sugar into the system; and that if this diet can be well borne by the patients in other forms of diabetes mellitus, and consistently and strictly carried out, a material diminution of the symptoms of diabetes and the gastric complaints will follow. The undoubtedly good effect, too, of alkalies and alkaline waters in the treatment of diabetes mellitus, only to be accounted for by their direct influence upon the intestinal tract and its contents, may, I think, be considered to speak conclusively for the great probability of my hypothesis.

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* It is well known that a food perfectly free from sugar is scarcely to be found, with the exception of cheese and fatty substances, as even flesh and eggs contain some; the first possessing muscle sugar and chondro-glycose, and the latter traces of grape sugar.

ON ORGANIC STRICTURE OF THE ŒSOPHAGUS.

By Benjamin W. Richardson, M.D., F.R.S.

This is written purely as a clinical essay, for immediate practical use. In constructing it, but one source of authority has been consulted, the natural facts I have observed in the labour of watching—the development, the distinctive characteristics, the progress, and the treatment of the malady under consideration: *Organic Stricture of the Œsophagus.*

I shall refer to four subjects relating to this disease, viz.—

(*a*) Its development;

(*b*) Its distinctive characteristics, including the differential and absolute diagnosis;

(*c*) Its progress;

(*d*) Its treatment.

The question of the pathological nature of the malady is intentionally omitted, as belonging, exclusively, to the broader subject of the pathology of the malignant diathesis, on which I, for my part, am unprepared either to accept any old or advance any new hypothesis.

As I call up before me the different sufferers from œsophageal stricture who have been under my observation, they resolve into distinct classes. In some the stricture has been purely spasmodic, and brief in duration, bringing no intense anxiety. In others it has been spasmodic, but prolonged in duration, bringing anxiety with hope. In a third class it has been organic, and permanent, bringing anxiety from first to last. I pass over, in the present essay, the two first of these classes, and deal only with the third: I mean the examples of organic and persistent stricture.

From this class of organic stricture I exclude, on the present occasion, the consideration of traumatic cases, and of cases in which the constriction is produced by some external pressure, such as aneurism or other tumour.

I also exclude, except by way of general comment or of contrast, all reference to cases that have been casually observed, as well as to certain doubtful cases where the diagnosis has been obscure. Thus limited in design, I have before me for matter of description ten typical illustrations of the organic disease. Of these cases I learned the full clinical history, and their history is the basis of what is to follow.

THE DEVELOPMENT OF THE DISEASE.

Under the head of Development of Organic Persistent Stricture I notice first, that every patient I have seen has on careful enquiry been found to bear some hereditary taint of malignant disease. As a rule, one or other parent, or a brother, or a sister, have suffered from cancer; but in no instance has the family proclivity shown itself before in this particular local manifestation of malignant out-growth. I have met with cases of cancer of other parts, where I could not trace a taint of hereditary kind; but in this particular malady no such exemption is known to me. The fact indicates, I think, that in examples of true stricture of the œsophagus the cancerous quality, of whatever that may consist, is peculiarly impressed on the individual, and it suggests particular significance if, when even slight evidences of œsophageal obstruction are offered, the taint of malignancy is markedly demonstrated.

I observe again, from the histories before me, that each example of stricture of the œsophageal tube has been uncomplicated with development of cancer growth in other parts of the organism, or indeed with any other important organic disease. The patients I have seen have all been healthy, to use a general term, up to the time when they were attacked with the special complaint, and, as a rule, they have been active persons, of steady and correct manner of life. I have never seen the faintest light that would exhibit their complaint with any specific taint except that of cancer; each typical case has been free of syphilis, tubercular disease, and struma. This I admit may be mere coincidence, but it is so striking I incline to treat it as of greater import, I mean as showing this disorder to be altogether independent of the specific conditions named,—syphilis, tubercle, struma.

I have noted as a third fact in relation to development that the disease is pretty fairly equalized between the sexes. In the ten cases to which I more particularly refer, six were male and four

were female subjects. In cases I have seen but casually the proportion was more nearly equal.

I have gathered in respect to the age at which stricture is developed that the middle period of life, or a period shortly before that, is the most favourable. In my cases the average age has been, as near as I could arrive at the truth, forty-two years. I have never seen the disease commence under the age of twenty nor over sixty: further, I have never known a patient with the true disease live over sixty years. The youngest persons in whom I knew the stricture to develope were a youth twenty-two years old and a woman twenty-five: the oldest persons were two men of fifty-six years.

I have remarked in respect to the seat of the disease that it is most common in the upper and middle third of the tube. In seven cases out of the ten the stricture was in the upper or middle third, but in two of these there was a second stricture in the lower third, and in one, two other strictures in the lower third, the existence of which, though suspected, was only proved by the post-mortem examination. In three cases the stricture was in the upper third of the tube.

A further point in respect to development of stricture of the œsophagus is to my mind most important, especially, as will afterwards be seen, in respect to treatment; and it is this—that, of all the serious maladies affecting man, this stricture is the most insidious in its approach. It is attended at first, according to my observation, with very little pain; in which it differs from most other cancerous products, and it proceeds without pain until such time as it becomes a cause of obstruction to the passage of food. The reason of this insidious progress is twofold: the mucous surface of the œsophageal tube is, from immediately below the pharynx, very faintly sensitive to the impressions made upon it by the passage of food; and the tube itself is so elastic and is so easily dilatable, resistance is not felt until the diameter of the tube is greatly reduced, reduced to probably one half its natural size. The result is, that, so soon as the difficulty to the passage of food through the strictured part is actually experienced, the disease has advanced far beyond what might be suspected, from the general condition of the patient. As a rule, to which I have seen but three exceptions, the primary definite evidence of obstruction has been followed within three months by hopeless obstruction.

The evil thus encountered is added to by yet another belonging

to it, viz., that as emaciation proceeds from inability to swallow sufficient nutritive food, so the development of the diseased stricture progresses, not only with proportionate increase, but with the addition of ulcerative changes in the neighbourhood of the stricture, and especially in the mucous membrane immediately above it. Thus pain and exhausting irritating discharge are added to the original malady.

Under this head of enquiry, I have tried to ascertain if in any cases there was proof of development from the infliction of injury or of accident of a mechanical kind. In one instance such origin did seem to have happened, the patient affirming that the first indication of pain in swallowing followed upon a brutal pinch of the throat by a schoolmaster of the old and severe school. Years elapsed in this case before the malady, from which the patient succumbed,—a stricture of the œsophagus in the upper third of the tube,—was fully developed, so that there might or might not be an error in the supposition, as to the exciting cause. In all the other cases I have seen, no suspicion of injury of any kind presented itself.

But although there was, as a general rule, an absence of a direct exciting cause of a purely physical character, there was in each case unmistakable evidence of indirect injury through the nervous organism. All had received some one or other of those severe shocks which pass through the senses too silently to be recognised, and yet so potently as to leave effects that are lasting for life, effects developed physically in change of those local structures that are by hereditary tendency weakest against shock. Intense grief, sudden poverty, blighted hope, baffled greed, or cruel constraint, had, one or the other, been at work in every instance I have observed, and had left its impress. Thus, in the face of each sufferer the muscular language was of sadness; in every heart the tension was reduced, or at best was uncertain; in every expression of thought by words, the future was excluded, except in terms of, I had almost said, abject dejection.

It is probable that these mental conditions are rather connected with the general diathesis than with the special or local change that springs from it; but they are none the less characteristic of the developing stage of the pure local manifestation.

DIAGNOSIS, DIFFERENTIAL AND ABSOLUTE.

In the diagnosis of organic stricture of the œsophagus one preliminary and general fact should be specially remembered, viz., that

the earliest symptoms appreciated by the patients themselves are not necessarily the symptoms of constriction.

In five of my cases, the patients had no knowledge of their own respecting the stricture. One complained of a troublesome stomach cough, which was much increased when he swallowed food or drink, and was attended by a profuse expectoration of a stringy mucus which he considered came from the bronchial tubes. Another patient complained only of a sense of burning in the stomach after the taking of food, and which was followed by vomiting. A third assigned as the leading subjective symptom, a pain in swallowing that was variable both in respect to locality and to duration. It was always an acute pain, but sometimes it was in the stomach; at other times it was between the shoulders, (from which latter fact an affection of the liver had been inferred); and while after one meal it would pass away in a few minutes, after another meal it would last for two and even three hours. A fourth patient after taking food experienced shivering, "as if from ague." A fifth was herself actually unconscious of any malady at all except weakness; she simply felt prostrated; she did not care to eat because the taking of food was an annoyance, and she submitted to see a physician for the sole purpose of quieting the urgent solicitations of her relatives, who observed, with alarm, her rapid emaciation, and her exhaustion and spasmodic attempt to swallow whenever she could be induced to take a minute quantity of solid or even of fluid sustenance.

The other five patients had become conscious of a difficulty in making food descend into the stomach, but they had not at first attached much importance to the difficulty. They had, in fact, met the difficulty for themselves, to some extent, by living on fluids or on minced foods, and had not seriously thought themselves ill until the systemic exhaustion incident to this character of food was experienced; until, in short, the moral of the old fable of the belly and the members began to be personally realized.

I notice these preliminary data in order to put the practitioner on the alert when objective symptoms pointing toward œsophageal stricture are negatived or qualified by evidence of the subjective order. To my mind, in all cases of disease one objective sign is worth ten subjective; but in no class of case is this rule more determinate than in the class now under our observation.

We are thus driven mainly to objective evidence in the diagnosis of true œsophageal stricture, and on this we often have to differentiate symptoms before we can establish an absolute diagnosis.

I.—DIFFERENTIAL DIAGNOSIS.

In the differentiation of symptoms I have met with the following difficulties.

(*a*) *To differentiate between Organic Stricture, and Stricture from Spasmodic Contraction.*

The points of difference in this instance are, that in simple contraction the patients undergo emaciation slowly; they can, at times, take fluids with comparative ease; and they are of hysterical constitution. A peculiar physical auscultatory sign also marks these cases. I mean vascular murmur, sometimes venous murmur, but always arterial; either subclavian, thoracic, or abdominal. The murmur indicates a reduced arterial tension; the reduced arterial tension indicates irregular nervous stimulation; and that indicates, in turn, ready tendency to irregular contraction of involuntary muscular fibre. The murmur may be present in true cases of organic stricture, but, combined with the other symptoms named, it is exceedingly symptomatic of the simple form of constriction.

The exploring tube in spasmodic cases completes, as a rule, the solution of the difficulty; for if the operator be firm, gentle, and resolute, not only can a bougie be passed into the stomach with moderate facility, but when a bougie of small or medium size has been passed, one of large size may at once be made to follow as easily or even more easily than a small one.

The spasmodic cases are usually so amenable after their true diagnosis has been established, they give but little anxiety, however great the trouble. Exceptions to this rule do nevertheless occur. I once opened the body of a gentleman who died of pure starvation, under the subjective belief that he could not swallow any food or drink; a belief he maintained so long as he remained conscious, that is to say, up to a few hours before his death. By some kind of firm resistance of an involuntary or unconscious voluntary character this patient prevented the passage of any bougie along the œsophageal tube. The course of the case was in many respects identical with that of true organic stricture, and its termination was identical. Yet after death the œsophagus was found free of obstruction, and, in fact, perfectly natural throughout the whole of its course.

(*b*) *To differentiate between Organic Stricture, and Constriction produced by External Pressure of an Aneurism upon the Œsophagus.*

The points of difference in this instance are more difficult than in the last. Three kinds of external pressure produce constriction

of the œsophagus which render diagnosis very difficult. These are, aneurism, aortic or innominate; mediastinal abscess; mediastinal tumour. The pressure of a goitre may also be a serious cause of obstruction, but it is so obvious a cause it may be passed by.

I have twice seen obstruction of the œsophagus produced by aneurism, once by aneurism of the innominate, and once by aneurism of the arch of the aorta. The particulars of the last I detailed many years ago to the Medical Society of London, and exhibited the large aneurismal sac, with its immense mass of laminated fibrine, as it had been freshly removed after the death of the patient. From these cases I draw the following points of differential diagnosis as between pressure of an aneurism and an organic stricture. Absence of the peculiar mental depression, and absence of hereditary history of malignant disease, as negative evidences; with the addition of the positive symptoms, subjective and objective, of the aneurismal tumour; viz., the objective signs of oppressed breathing, of difficulty in climbing ascents, and of consciousness of pulsation within the breast; the subjective signs of murmur, of dulness on percussion, of pulsation, and of increasing difficulty of deglutition in proportion with the size and solidity of the pulsating tumour.

(*c*) *To differentiate between Pressure produced by a Mediastinal Abscess, and Stricture of the Œsophagus.*

The differential diagnosis in this case is comparatively easy. The history of the symptoms of abscess is clear: there is a preceding pyrexia of an acute kind, rigor, rapid and great variation of temperature, hectic upon suppuration, and a series of physical signs of thoracic disease sufficient to account for pressure on the œsophageal tube. There is also a symptom of pain, sometimes very acute, extending across to the sternum, in cases of abscess which does not belong to stricture; and finally there is the pressure on the pulmonary structure, and commonly suppuration and discharge through that structure, into the bronchial canals.

(*d*) *To differentiate between Stricture of the Œsophagus from the Pressure of a Tumour lying external to the tube, and Organic Stricture of the Tube.*

The difficulty in this diagnosis is very great; in some instances quite insurmountable previous to death. The tumour itself is often malignant, and the history of the patient is therefore from an early period the same as in organic stricture. The subjective symptoms are then identical, and the objective may be so. On

two occasions I have been unable to form a correct diagnosis in such examples.

There are nevertheless one or two signs which may help to distinguish tumour. The general symptoms of depression, precede, for a long period, the particular symptom of obstruction; there may be interference with the respiratory organs, occasional attacks of pleural irritation and spasmodic breathing; there may be pain of a persistent kind, more or less extreme through the chest from the seat of the tumour; there may be distinct physical evidence of dulness on percussion over the tumour; and the difficulty of swallowing may be experienced more in one position of the body than in another position, whereas in true organic stricture the difficulty is experienced equally in all positions.

These differences apply chiefly to cases where the tumour is large and of steady growth. In the instance of small tumours in immediate external contact with the œsophageal tube, and lying between it and the vertebral column, the diagnosis admits of no differentiation of which I, at least, would presume to speak, except on one point, viz., that in exploring with the bougie, the pressure of it, on reaching or on passing the constricted part of the œsophagus, is productive of pain reflected sharply through the parietes of the chest; while in organic stricture, if there be pain from the use of the bougie, it is local in its character.

(*e*) *To differentiate between Reflex and Organic Stricture.*

There is a form of œsophageal constriction which arises from reflex irritation at a distance from the tube itself. I saw this once typically marked after an operation on a goitre. I opened a large cyst in a goitre while making an exploratory puncture, and let out fifteen ounces of serous fluid. In a few weeks fluid re-accumulated in the cyst, so I tapped it, and to effect a radical cure injected it with iodine in the same manner as if it had been a hydrocele. For a few days all went well, but on the fourth day after the injection, as the inflammation was subsiding, and the sac was contracting, there came on a rigor, followed by a little rigidity of the muscles of the jaw. I feared at first that tetanus might be announced; but after a time the rigid muscles relaxed. The sterno cleido mastoidens on the left side was, however, thrown into a contraction which lasted several hours, and on this muscle relaxing there succeeded extreme constriction in the œsophagus, so that even fluids could not be swallowed. Happily this very troublesome

symptom passed away, and the recovery in all respects became perfect.

In such a case as is here narrated the diagnosis is easy enough, because the direct cause of the attack of constriction is immediately under observation; the external source of the irritation is known. It is more difficult, however, to diagnose in other cases where the remote irritation is on an internal surface, and is not appreciable except by indirect methods of research. Here the only differential characteristics are the suddenness of the attack of constriction and the briefness of its duration.

(*f*) *To differentiate between what may be called Traumatic and Organic Stricture.*

I have known one or two cases in which constriction of the œsophageal tube has resulted from injury to the tube, the effect of swallowing an irritant poison. In one of these cases, the constriction has been persistent, but never so serious as to prevent the patient from swallowing liquid or semi-liquid food. In the other case, the constriction occurs at intervals, and is attended with disturbance of the digestive functions, and with what is commonly considered to be suppression of the bilious secretion. But on no occasion is the constriction so great as to obstruct, altogether, the passage of food. The history of the traumatic origin of obstruction is in these examples of stricture fairly distinctive, separating them from organic stricture, unless in the rare instances in which the organic mischief is elicited by or is coincident with mechanical injury. A more secure differential indication of the traumatic form of stricture, is its continuance for many years without progressing to a fatal obstruction.

II.—ABSOLUTE DIAGNOSIS.

The absolute diagnosis of organic stricture of the œsophagus, divested of all surrounding or complicating symptoms, may, I think, be summed up under the following heads.

(*a*) *Subjectively.*—Difficulty of swallowing food in whatever position the body of the patient may be at the time of swallowing.

Return of food soon after the attempt to swallow, but without pain, and without the retching and sensation of nausea or of faintness, which usually accompany ordinary vomiting.

A troublesome cough, referred to the throat, and increased by swallowing food.

An increasing dislike for food, and a sensation as if food could not be borne without oppression.

A sensation of general coldness of the surface of the body, with alternating flushes of heat.

A steadily increasing muscular exhaustion.

A nervous depression, extending through all the instinctive life; producing failure of the passions, melancholy, and carelessness about surrounding events or objects, and even about life; but without a corresponding failure, until very late stages of the disease, of the reasoning faculties.

(*b*) *Objectively.*—A history, what may be called in most cases, a strong history, of malignant disease in the family of the patient.

A muscular expression of exhaustion, physical and mental, without the occurrence either of acute pain or of sleeplessness or of waste from excessive secretion.

A verbal expression of melancholy and of hopelessness of recovery.

Emaciation, first from waste of adipose, and afterwards of muscular tissue.

A frequent cough, with the expectoration of a peculiar clear stringy mucus, often very copious, and occasionally tinged with blood. The said mucous secretion unattended by physical evidence of bronchitis or other diseased condition of the lungs.

A peculiar collapsed condition of the epigastrium, noticeable at a very early stage of the disease.

A slightly bronzed or darkened surface of skin.

A small, irregular, and sometimes intermittent, pulse.

A dry and darkish red tongue.

A low temperature of the body, which steadily becomes more and more marked, and an index of the progress of the disease towards death.

A peculiar odour of the breath, at first earthy in character, or like fresh pipe-clay, and afterward becoming fœtid, in some cases insupportably fœtid.

Physical evidence, on passing a bougie, of constriction in the œsophageal tube.

Physical evidence of a regurgitation conveyed through the spinal column to the ear, at or near the point of the stricture, when the patient attempts to swallow water or other liquid.

When a majority of these signs are presented, without any of the

complications to which reference has been made, the diagnosis may be considered absolute. The value of the symptoms in the matter of diagnosis are very equal. They are of varying value in respect to the information they convey as to the duration and course of the case. This fact will be made more distinct in the sequel.

Before I leave the subject of diagnosis I must beg to offer one other observation, as singular as it is true and important. It is this: that, in some instances, an organic stricture of the œsophagus, before it is sufficiently developed to produce serious obstruction to the passage of food, may give rise to symptoms which conceal the actual disease even until its latest stages.

Thus, in one of my cases, owing to implication of nervous filaments in the organic growth, the earliest commanding symptoms were developed in the larynx in the form of laryngeal ulceration. This irritation in the larynx, in its turn, rendered the act of swallowing painful because of the sense of choking, and for weeks I failed to detect the primary œsophageal disease. At last the truth dawned on me, and on passing a bougie, I found, in the upper third of the tube, a firm stricture, which the post-mortem ultimately revealed as a hard malignant growth, extending through the diameter of the tube, and pressing upwards and forwards upon the arytenoids and upon their nervous supply.

Two of my cases, again, came to me as cases of chronic bronchitis. In health the natural secretion of the mucous surface of the œsophagus passes into the stomach; but when the tube is partly closed this escape is prevented, the mucus accumulates, irritates, and causes cough, with free expectoration. The mucus under these circumstances finds its way into the glottis, and sets up true respiratory cough. Hereupon the error of mistaking the actual disease for a bronchial affection is easy if sufficient time be not given to the examination of all the facts.

Lastly, in persons who have been enfeebled before the occurrence of stricture, and who have shown weak digestive power, with depression of mind, the illness, as I have once known, may be attributed to primary failure of the digestive functions, and the stricture be altogether overlooked. In the case of this kind to which I allude, the existence of the primary disease, œsophageal stricture, as distinct from the affection of the stomach, was only discovered three weeks preceding the death of the patient.

THE PROGRESS OF THE MALADY.

Cases of organic stricture of the œsophagus run, according to my observation, a course invariably fatal. I have heard of recoveries, but I know of none. The most favourable conditions, in the course of any case, are conditions of respite or of slow continuance of the disease, with alleviation of suffering.

The character of the symptoms in the way toward death is varied, in different illustrations of the disease, as it is seen in different persons. My cases have yielded four distinct forms of death. Thus, of the ten patients, five died of pure starvation after a prolonged struggle for life; one died during starvation, (while yet he could swallow food, and while yet he could walk out in the air,) from the immediate effect of a surgical accident in an attempt to dilate the stricture; one died before starvation had accomplished its work, from the extension of the malignant disease, which was situated in the cervical region of the tube, forward to the trachea; one died from bronchital irritation and suffocation, in what may be called the second period of starvation; the remaining two died suddenly with symptoms of coma and active convulsion.

The five cases of pure starvation were all marked by one special series of conditions. The patients, previous to the attack of stricture, were strong, well nourished, and comparatively young and healthy. The stricture was of moderately slow development, and was confined solely to the œsophagus; I mean, it did not by extension interfere with any surrounding parts or organs. In these sufferers the adipose tissues first underwent waste, then the muscular; the skin became dry, shrunken, and sallow; the physical power declined; the desire for food, so urgent in the first stage, became reduced in the second, and absent in the third or last stage. Fluids were taken to allay thirst, although they were often not swallowed. In every instance the mental faculties remained clear to the end, and the heart maintained its power when the other muscles were practically powerless. The brain and heart, in short, were the last to die. Some weeks before death, the breath in these sufferers had a peculiar, and, I may say, characteristeric odour. The odour was that of earth or clay: after a time the odour became more distinctly fœtid, and toward the end was exceedingly offensive. From the commencement of the wasting there was in all these patients a declining temperature of the body. In no instance was there

colliquative perspiration nor any flux. The approach of death was marked by rapid pulse and falling temperature.

In the example of death from accident, an example, I believe, by no means isolated, there had been evidence of ulceration above the stricture. I had myself, in trying (in conjunction with the late Mr. J. F. Wells) to pass a bougie, found that the instrument when it reached the stricture caused much local pain and created free exudation of mucus tinged with blood. I therefore declined to do more in the way of attempting to get an instrument past the obstruction. The friends of the patient, dissatisfied with this treatment, took him after a few days, to an eminent surgical practitioner, who, uninformed as to what had been already tried, passed a bougie into, as it was believed, the stomach. Very soon afterward the man experienced great pain in the chest, and with difficulty reached his home. On essaying to drink some warm milk, he found it pass the obstruction, but afterward experienced extreme pain and difficulty of breathing. Mr. Forester Wells was summoned, and sent for me, but before my arrival the patient was dead. At the post-mortem we found a firm, almost cartilaginous, stricture in the middle third of the œsophagus, with an ulceration in the mucous surface above, through which weakened and easily rended part the bougie had passed into the right pleural cavity. The milk that had been swallowed was found in the pleural cavity uncoagulated.

The patient in whom there was ulceration extending to the trachea, died early in the course of the disease, in what may be called the close of the first stage, while desire for food still remained and the temperature of the body continued natural. I think this was the most painful form of the disease I have witnessed. The slightest attempt to feed by the tube, or to get food down without it, caused such irritation and cough, that feeding was all but impossible. The nervous supply of the larynx became implicated, especially the inferior laryngeal, and the repeated attacks of dyspnœa were of the acutest and intensest kind. A young woman of fine organization, and possessing an abundant charge of what we call vitality, she combated death for weeks against all hope; she died at last after a severe attack of dyspnœa, in a kind of sudden syncope, or mixture of syncope and asphyxia.

The patient who had what may be called bronchial symptoms, suffered, from the first, from profuse secretion of stringy mucus in the œsophagus, above the stricture. He it was who came to me

believing his malady to be bronchitis. He had frequent short attacks of cough, followed by vomiting of a few ounces of glairy fluid, which, as he expressed, "he could draw out of his throat," it was so tenacious. He also said the mucus was very irritating, "as if it stung him." When this mucus was removed by a sponge, the stricture could easily be reached and passed; and sometimes after vomiting, he could, with great effort, swallow milk, so that he lived for four months in a second stage of starvation, wasting and becoming more enfeebled, but able to walk about at times, and suffering very little except from the secretion and cough. At last, either from extension of nervous irritation, or from escape of mucus into the bronchial cavity through the glottis, he was seized with a bronchial spasm, followed by condensation of fluid in the bronchial passages, in which condition he succumbed from asphyxia.

The course of the symptoms in the two last cases was special, and, was I think, a course which, though it must often have occurred before, has not been described. I must dwell therefore upon it forcibly, however briefly. The patients were both ladies who had passed the meridian of life, and, in a word, were much worn. They were emaciated and feeble before they began to suffer from obstruction in the œsophagus, and were morbidly sensitive to the effects of cold. One of these ladies, in the first stage of starvation, after some slight depression, fell into coma with active convulsions which recurred several times, and thus she died, suddenly, as her friends conceived, and from some distinct cause of death. The second lady, whom I did not see until she had reached the second stage of exhaustion, rapidly became more enfeebled, and on her last visit to me complained exceedingly of cold, although she could still, with difficulty, swallow liquids. I found her temperature to be 95° F. Forewarned by what I had seen before, I prognosed, to Dr. McOscar, who was in daily attendance, that death would probably occur from coma. The prognosis was. unfortunately, confirmed on the following day.

The cause of death in these cases is plain. The death is identical with the coma of cold, and the convulsion is identical with the convulsion of hæmorrhage.

In these cases the thermometer comes to our aid as importantly as it does in pyrexia; and the lesson I would suggest from it, in the course of a case of œsophageal stricture, such as I have described, is, that whenever the instrument declares decrement of animal

heat, of two or three degrees, it is time to look out for coma, convulsion and sudden death.

In relation to all classes of cases of œsophageal stricture, one further fact bearing upon their course should ever be present in the mind of the physician. This fact is, that there are natural seasons of animal waste and repletion. In the month of March, as the late Mr. Milner of Wakefield—by one of the greatest medical researches ever conducted in this country—proved, there is a normal waste of the body, equal to 0·95, the loss commencing in October, and extending to the end of March. Hence in this period the fatal course of stricture of the œsophagus is the more determinate.

TREATMENT.

In entering upon the question of the treatment of organic stricture of the œsophagus, I should hesitate to differ so widely, or rather to depart so widely, as I must, from some ordinary rules of practice, were I not backed up step on step by facts learned in the school of treatment. At one time I thought (so hopeless is all attempt, at this moment, of radical cure) it were useless to try to prolong life in the terrible suffering with which it is borne by the patient fatally stricken, and that it were better to accept the frequent prayer, "Let me simply die without pain in due time," as the most beneficent portion of medical art. I have learned since, that, although a radical cure is as far away as ever, life may often be long sustained, and in comparative comfort. In this effort, which professes to be only sustaining and palliative, I set aside all thought of cure by specific medicines, such as iodine and iodides, or by what are called tonics. I forbear, moreover, in reference to any medicine, to employ the stomach as the channel of administration. If an aperient action be required, I obtain it by enemata; if a narcotic action be required, I secure it either by enema, by inhalation, or by subcutaneous injection. Thus the stomach is held at rest, for digestion alone as its function.

The first endeavour in the way of rational treatment is to supply food. This will be admitted on all hands, but there will be a difference as to the mode of supply. The rule has been to attempt to dilate the stricture so that the patient may swallow in the ordinary way. I have tried this method rigorously, and the

conclusion forced upon me, by results, is, that it is not only wrong, but fatally wrong. I learn that feeding mechanically through the stricture must come first, and that every attempt at dilating, if it be advisable to make the attempt, must follow.

The reasons for this plan are simple. Frequently the attempt to dilate the œsophageal tube defeats its own object; irritation is produced by it, and swallowing, which before was possible, becomes impossible. But if a small feeding tube can for a few days be passed through the s icture, the strictured surface becomes less susceptible to the presence of a foreign body, and dilatation, if it can succeed, succeeds more promptly. As a rule when patients who are emaciated and weak from want of food are subjected to the operation of forcible dilatation, they become anxious, nervous, and even faint: as these conditions are slowly and imperfectly recovered from, there succeeds an abortive reaction, flushing, hectic, and subsequent coldness. In a word, by one severe effort at dilatation that tells on the organic life, the physician may take as much force out of a starving person as may shorten life for many days, because the starved cannot make up from new supply of the condensed force in food.

So I now feed first; and on this matter of feeding I have learned a few facts, childish perhaps in their way, but useful.

I prescribe at once the administration of food by two channels, by the stomach artificially through the stricture, if the patient cannot swallow, and by the rectum; and I divide the food into kinds, according as it may be fitted to enter the system by the different channels, the rule being to give as little as possible by the stomach of such foods as will be taken up by the rectum, and to give no foods by the rectum that cannot be readily taken up by it.

A word or two of a physiological character is required in elucidation of this subject. As substances capable of being absorbed into the body, foods are of four kinds: one partaking of the crystalloidal, another of the colloidal, a third of the oleaginous form of matter, a fourth of water. Of these, the crystalloidal and water foods obtain admission into the body by any channel; they will enter through a mucous or a serous surface, and find their way into the circulation. The colloidal substances require a special method of introduction they must pass into the stomach and into the upper intestine before

they can enter the circulation. The fatty or oleaginous parts of food require the particular arrangement of the villous surface and the lacteal system, to enable them to enter the blood for the purposes of nutrition.

Through the rectum we can introduce water, and all soluble substances of the crystalloidal type of quality, such as sugars, salts, the directly soluble part of milk, and alcohol. But we cannot through this channel introduce any colloidal foods usefully. The albuminoid of all such substances is simply deposited on the mucous surface, and is removed after more or less of decomposition with the excretions.

It is therefore the best practice to administer all the crystalloidal foods, water, and alcohol by the rectum ; and all albuminous and fatty foods by the stomach, so long as their passage through the œsophagus is possible. The best albuminous foods are milk, eggs in combination with flour or rice, Liebig's meat extract, and as much fatty matter as can be tolerated.

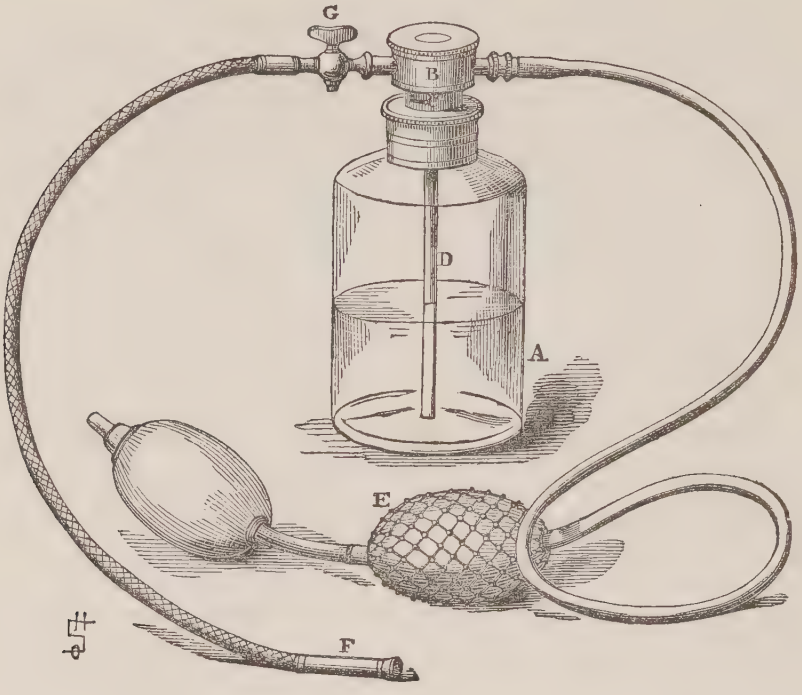
A pint of warm new milk, in which is dissolved a quarter of an ounce of fresh butter and a teaspoonful of Liebig's extract, forms on the whole the best meal I know for introduction into the stomach in the patients who are now under observation. I kept one patient living for many weeks on this food, (substituting occasionally either arrowroot or gravy of meat, for the meat extract,) when one meal only could be administered in the day.

As to mode of feeding, if there be distinct difficulty in swallowing, I advise the immediate resort to a small feeding tube, for the successful use of which, experience yields many useful hints.

When the passage for the tube is very small, the feeding tube may pass it and reach the stomach, and yet fluid will not run through the tube, owing to the existence of gas in the stomach, which gas escapes often with vehemence through the opening. Under these circumstances we cannot force in the liquid. To meet this difficulty, I have invented a double current tube, which consists of a long tube within an outer tube; the long tube delivers the food, and through an outlet in the outer tube the gases of the stomach escape.

The food when introduced, must be passed in very slowly; if the stomach is the least oppressed, it often revolts, and the meal had better not have been given. To meet this necessity of slow introduction of food, I use a feeding bottle or flask, after the

manner of a Wolf's bottle. The fluid, as will be seen from the engraving, is made to pass into the œsophageal tube by the mere pressure of air derived from a hand bellows.



I am convinced that all attempts to supply the stomach with solid food is an error. Solid food obstructs the tube, and the stomach digests with uneasiness all it receives. The foods should consist of homogeneous fluids, as even and soft in quality as they can be prepared.

They should be well warmed before they are taken; they may be raised with advantage to 115° or even 120° F.

I had one patient, who, when the tube was introduced, could swallow by the mouth, the fluid then passing through the stricture. This is an immense advantage, as it does away with all apparatus except the tube, and enables the sufferer to feed himself after the tube has been introduced. The objection to the plan is, that in some instances the fluid will not pass by the side of the tube, while in all cases the presence of the tube in the mouth is disagreeable. To obviate these objections, I have constructed a short feeding tube, which, mounted loosely on a blunt stylet, can be introduced through the stricture and left there, the stylet being withdrawn. To the tube are attached two strong silk cords by which it can be raised when required: as the mouth of this tube is below the level of the glottis when it is introduced, the patient may swallow slowly through it at leisure. I believe a patient may learn to use the tube

himself, and it may be proved, in practice, that such a tube can be worn for some hours, and act also as a dilator.

It is not until we glean the fact, from observation of persons who are suffering from stricture, that we know how comparatively small an amount of food will sustain life, and especially if the respiratory foods be, as in all these cases they ought to be, given freely. If twenty ounces of new milk, or an equivalent of that, can be introduced into the stomach daily, two injections by the rectum will support life in a remarkable manner. The injections should carry respiratory foods that are soluble. The Anglo-Swiss milk, which is rich in sugar, is an excellent substance for injection, when diluted with water. There is also a substance now made, called Saccharina, a condensed glucose, which is very soluble and very fattening, and which may be employed with much advantage.

In making the injections, all viscid, or oily, or coagulable fluids should be specially avoided. They are not absorbed, and they interfere with absorption.

To what extent alcohol should enter into the foods administered to the starving is a question of great moment. I think it may be answered fairly. Alcohol in any excess reduces the animal temperature; that fact I proved and explained many years ago, and all after experiments have confirmed the observation. In a condition during which the body is undergoing a process of low and imperfect combustion it must, therefore, be wrong to give alcohol in excess. Alcohol, again, relaxes the minute vascular tension, relieves the heart of pressure, and, in moderation, aids circulation; and in this sense it is to a certain degree useful in combination with food, and particularly with respiratory food. In the proportion of from one to two ounces per day, it is, I believe, on the whole, useful. It should always be administered by the rectum, from the surface of which it is rapidly absorbed, and the form in which it is best to administer it is as rum; an ounce and a half of sound rum in a pint of other selected fluids.

I may add that the bottle that is used for feeding is the best also for the administration of the injection, a long rectum tube being affixed for this purpose to the exit tube. Patients with this bottle easily administer for themselves, so long as they retain sufficient muscular power.

After feeding, the most important point of treatment is to conserve the animal temperature. In all these cases of starvation it is not the muscular structure that first fails, but the force that animates

the structure. Every precaution, therefore, must be taken to secure warmth. It is not sufficient that the patient should be well clothed, for clothing may be carried to the extent of inducing fatigue; the atmospheric air breathed by the patient must be kept warm. A temperature of 70° or even 80° F., if it do not produce waste by sweating, is not too high in the later stages of the disease. A temperature of 65° is the lowest that should be permitted at any stage.

After feeding and warmth, there follow certain other rules of practice.

In cases where there is a free secretion of mucus in the œsophagus it is advisable to clear it in the later stages of the disorder, and this especially before giving food. I have constructed for this purpose, a tube containing a conical sponge, which, passed down to the stricture, can be pushed out and made to remove any secretion that shall have accumulated. The sponge acts best if, before it is introduced, it be moistened with a weak acid solution, viz., one minim of sulphuric acid to forty minims of water, to which may be added five minims of tincture of myrrh. The sponge is also useful for conveying any fluid to the stricture.

I have already expressed that the introduction of a tube for the purpose of conveying food ought in every case to precede any attempt at dilating the stricture. I do not, however, by this statement wish to throw the process of dilatation on one side. On the contrary, I have studied with much care various mechanical contrivances bearing on dilatation. At the same time, I confess that dilatation has not been a very successful practice in my hands. I have hitherto always found it wise to desist from it after a few fair trials; and I am convinced that the use of the slightest force is an injury. Whatever is to be usefully effected by it, must be carried out with the utmost gentleness and steadiness. The conical dilators that have been introduced, and all forms of dilators that make a direct downward pressure, are pregnant with danger. As the stricture is pressed, the œsophagus elongates, the idea is conveyed by this, that the dilator is making its way through the opening, more force is applied to carry the dilator on and the results are deception as regards dilatation, and injury or risk of injury to the mucous membrane from the tension to which it has been subjected.

If dilatation is to be employed with success, it must follow the feeding by a small tube, and must be carried out either by succeed-

ing series of straight dilators, increasing in size, or by a dilator that dilates by pure lateral pressure, and this not in part of a curve, but in a straight line running parallel to the surface of the œsophagus in its longitudinal course. The leaded dilators of Mr. Durham are exceedingly good.

Not from any disrespect to surgical art, I have deferred to this late moment all reference to performance of the operation of gastrotomy in extreme cases of stricture. Once a patient offered to me to submit to the operation, and afterwards wished for it. The temptation was great, and had I been able to find a record of so much as one successful, or even partially successful experiment conducted under the same conditions, I would have essayed the operation. I held back, and the rapid fatal termination was a warranty to me that I was right in the judgment I had formed, that the man had not sufficient life left in him to bear, with any chance of success, the shock of the operation.

The experiences that seem to lend countenance to the operation, such as the accident to Alexis N. Martin, and the experiments that have been made of feeding animals by an artificial opening into the stomach, do not, when faithfully studied, bear out the science of the proposed remedial measure. Alexis N. Martin, or the healthy animal submitted to operation, offer no analogy to the victim of stricture of the œsophagus, a victim worn out by starvation and by the continual depressing influence of malignant disease.

At the best the remedy, in our present stage of learning, would be but temporary and troublesome in effect. The organic primary disease would continue and destroy. Supposing by some unseen advance of science we should find ourselves able to hold the organic malady in check, we might truly then in some cases recur to operation with reason and hope. For my part, were I tempted ever to operate, I should not open the stomach, but the small intestine below, into which, by a fistulous passage, food might be introduced.

Specific medicinal remedies for the cure of organic stricture of the œsophagus I have already spoken of as unknown for any real usefulness. There are, nevertheless, some remedies which afford great and eminent service. I refer particularly to narcotic remedies. To procure from eight to ten hours' sleep each night, to be able to induce sleep when there is much pain, is an art not only beneficent, but the nearest approach we hold towards cure. The best narcotics in these cases are those that are least disturbing to the

stomach. Opium is not good because it produces dryness of the fauces, and nausea; chloral is open to the same objection in respect to nausea; and, in brief, the rule applies to all the fixed narcotics. The agent I have found answer best, is a mixture of equal parts of methylene bichloride and pure methylic alcohol, administered by inhalation. This is soft to breathe, and is safe and effective. In portions of two drachms it may be administered by a skilled nurse, and when its effect is produced in the sleep it entices, its best and worst influence is over.

One more and ultimate means for sustaining life in cases of organic stricture of the œsophagus I retain for a final, but brief word. It has engaged much of my attention, and has given origin to many of my experiments. I mean the attempt to feed directly by the veins. Up to the present moment this work is unfinished, and I should now but weary the reader by a recital of the attempts that I have made for its completion. Suffice it to promise that, if I live, I will one day submit this labour to the judgment of the profession.

NOTES OF A CASE OF ŒDEMA OF THE LUNGS AFTER SMALL-POX.

By Alfred Wiltshire, M.D., M.R.C.P. Lond.,

Physician for the Diseases of Women to the West London Hospital, Assistant Physician-Accoucheur to St. Mary's Hospital, Physician to the British Lying-in Hospital, late Medical Inspector to H.M. Privy Council.

Sudden Œdema of the lungs is not a common disorder, and probably under circumstances like those about to be related it is exceedingly rare.

On the morning of September 8th, 1871, I was asked to see Miss E. B., aged twenty-five, who had been suddenly seized with alarming dyspnœa and prostration. She was under the care of my friend, Mr. Lewis, who had attended her with small-pox a short time before.

On my arrival the patient was in the following condition. Her face bore evidence of recent small-pox, from which it appeared she had suffered about six weeks previously; the countenance was dusky, almost livid; she was breathing very frequently, and with extreme difficulty; moist râles were abundantly audible as one stood by her side; indeed, the patient appeared to have what is called "the rattles." She coughed incessantly, and expectorated an enormous quantity of glairy phlegm. She had jactitation, and her distress appeared extreme; indeed, death seemed imminent. Such parts of the chest as could be percussed were markedly dull; auscultation showed universal absence of healthy vesicular murmur, and the presence of moist râles and bubbling. The respirations were, as already stated, very frequent. The pulse was 130, and feeble. The heart's beats were feeble, but there was no murmur. The urine was small in quantity, but not notably so. Bowels rather confined, but had been opened on the previous day. The skin was purple, cold, and clammy. The patient, indeed, was in a state of collapse.

It appeared on enquiry that the foregoing symptoms had suddenly come on about three o'clock in the morning. (I saw the patient about eleven a.m.)

The existence of anasarca being obviously suggested, it was found on enquiry that for two or three weeks there had been some dropsy of the legs, which had gradually increased up to the previous day, when it had suddenly disappeared.

There had also been a little cough, attended by an insignificant amount of expectoration, for which homely remedies, such as marsh-mallow and liquorice, had been resorted to. The legs were a little, but by no means markedly, œdematous; from the description of the patient's friends it was clear that the limbs had very materially decreased in size during the past twenty-four hours.

The foregoing facts pointed to the occurrence of what is called "metastasis."

A rational plan of treatment appeared to me to be clearly indicated, and was carried out as follows. First some brandy was given on account of the collapse, with directions to repeat it in half-ounce doses every half hour until further orders; hot bottles were put to the feet, and the body was swathed in hot blankets; mustard was applied to the loins; two scruples of compound jalap powder were administered immediately, and every half hour a dose of a mixture containing carbonate of ammonia, tincture of digitalis, sulphuric æther, and sweet nitre; so that every quarter of an hour the patient had either some brandy or a dose of the mixture.

Decided relief soon followed the use of these remedies; the bowels acted in a couple of hours, the amount of glairy phlegm lessened materially, the breathing became freer and the respirations less frequent, warmth returned to the surface, the skin was bathed with warm perspiration, more urine was passed, the pulse became fuller and steadier; and in three hours' time, when I again saw the patient, she was, though still ill, apparently delivered from impending dissolution. More jalap was prescribed, as the motions had not been very copious, and a continuance of the same mixture, the doses to be taken less frequently. The urine, of which a sample was now obtained, was found to contain a little albumen; the amount, however, being small, and less than I had expected. By bed-time Miss B. had much improved, and was able to partake freely of nourishment. She passed a good night, and the next day was considerably better. Expectoration was still free, but not profuse. From the first, improvement was rapid; and before a week

had passed, Miss B. was sitting up and enjoying her food. My friend, Mr. Lewis, informed me that his patient made a speedy and excellent recovery after this, and that her health remained good.

This case was exceedingly interesting as well as satisfactory. Different views might be taken as to its exact pathology. Some, for instance, might maintain that the œdema was of solely cardiac origin; others that the kidneys were alone at fault. Either view held alone would perhaps be too exclusive, though of the two the probabilities incline most toward cardiac insufficiency, and I believe this was the principal factor to be borne in mind, at any rate therapeutically speaking. Obstruction suddenly occurring on the left side of the heart is a most efficient cause of rapid œdema of the pulmonary tissues. But in the case in question there was an entire absence of any evidence of left-sided obstruction; that is to say, other than that presented by the œdematous lungs. It was clear, therefore, that this could not be the cause. On the other hand, there was evidence of very notable weakening of the heart's power; the organ appeared to be too feeble to propel the blood through the vessels. Coupled with this cardiac insufficiency, was the remarkable fact that there had been a rapid recession of the anasarca of the lower limbs. There may also have been anasarca of other parts of the body, but no exact information was forthcoming on this point. This "metastasis" was not a little suggestive of renal mischief, and that of a kind analogous to that occurring after scarlatina, seeing that the patient was just convalescing of small-pox. The case appeared in some respects to be akin to those mentioned by Dr. Wilks in Vol. III. of *The Transactions of the Clinical Society*, under the head of "Cases of Cardiac Disturbance in connection with Nephritis." Dr. Wilks regarded his cases as instances of cardiac disturbance due to impairment of the function of the organ by uræmia, the dyspnœa, &c., being secondary.

In respect of the cardiac feebleness, it should be borne in mind that the patient had gone through a pretty severe attack of small-pox, which, like all the severer forms of acute specific disease, leaves the heart for the time being—that is to say, until the health is thoroughly re-established—in a damaged condition as regards its muscular structure; hence, primarily, the weakness. If to this condition we add such mischief as might be occasioned by the renal defect, slight though, comparatively speaking, that may have been, we shall, I apprehend, have enough to account for the attack, and its mode of invasion and course.

I regret that I have no note of the exact state of the urine other than that it contained a small amount of albumen. It certainly occurred to me at the time that we might have to do with a case, feebly marked it is true, of desquamative nephritis, like those seen, as already mentioned, after scarlatina. Obviously the case was serious enough, but had the effusion taken place into the pleural sacs instead of on the free surface of the lungs, probably a fatal result would have ensued with extreme rapidity. In this connection it may be remarked that pleurisy after small-pox is an exceedingly fatal affection.

Niemeyer says that in one exceptional instance of parenchymatous nephritis he witnessed the appearance of hydrothorax and œdema of the lungs early in the disease, where previously there had been but little tegumentary œdema, a condition of apparent security thus suddenly becoming one of great danger. There is considerable difficulty in determining why certain parts previously free should suddenly become the seats of œdema. Upon this point Niemeyer remarks:—"In chronic parenchymatous nephritis various organs are subject to œdema, the precise cause of which is unknown. It is characteristic of this œdema that it shifts its position. It may attack the lungs at any period, either early or late in the disease, sometimes causing death, and sometimes subsiding again after a short duration."

In reference to the treatment, it may be said that it was conducted on the principle of obviating the tendency to death, which threatened to be speedy, from over-distension of the right ventricle. On this hypothesis the diffusible stimulants, ammonia, æther, and brandy, together with digitalis, were administered in the full consciousness that in promoting increased contraction of the heart more blood would be driven into the already congested lungs, and that with greater force. Still, it was believed that any embarrassment arising from this would be of but brief duration, if indeed any were occasioned, and as unalloyed good is not a common experience, it was necessary to run such risk, if risk there were, in order to obviate the more immediate source of danger. The other half of the treatment was conducted on the principle of relieving the state of venous tension—for the pulmonic circulation may be said to be truly part of the venous system—and, by producing a freer flow to the intestines, and increasing the bulk of blood in the skin, relieving the congestion of the pulmonic system. For in œdema of this kind the question may be said to be merely one of

physics, a problem in hydraulics, and widely different from œdema which may arise from vaso-motor paralysis as from sunstroke. There means which could restore tone to the capillaries alone could be successful. But in œdema arising from venous distension, leaving one locality and fixing on another, the treatment is, to some extent at least, a question of taking advantage of physical laws. The congestion of the kidneys was on the same principle relieved by the application of hot poultices (mustard) to the skin of the loins, thus producing congestion of the surface and relieving that of the kidneys, their blood supply being, according to Professor Turner, of Edinburgh, the same.

And the result of the application of mustard to the loins was, what in my experience it very commonly is, a greatly increased flow of urine. Thus, then, the therapeutic measures resorted to in this case, in the first place gave tone to the heart, increasing the vigour of the circulation, and secondly, promoted the action of the emunctories—skin, bowel, and kidneys. Some may be surprised at the exhibition of a hydragogue cathartic to so weak a patient. In my judgment, it was of the utmost importance. The case was one of that class in which with one hand one bleeds, while with the other one pours in stimulants. Such cases are rare, but nevertheless are now and again met with, and then the treatment in question is gratifying in the extreme.

BRAIN INJURIES.

By Henry Day, M.D., F.R.C.P. Lond.,
Physician to the Stafford County Infirmary.

It has seemed to me that at a time when the attention of the profession is being specially directed, by special investigators, to special experiments performed with the view of proving the localization of particular faculties and functions of the brain, a few observations, principally of a clinical character, in connection with brain injuries, and the conditions resulting therefrom, might not be altogether without some interest.

After the years that have been spent by men of the very highest order of intellect in investigating the anatomy and physiology of the nervous system,—after the years that have been spent by the same men, or by men of equal intelligence, with persevering industry, in investigating the pathology of this system,—it will seem, I fear, both an ungrateful and ungracious task to call into question the practical utility of any portion of their work; whilst to carp or to cavil at what may seem to be their shortcomings, to point out cases which, it would appear, demonstratively establish the very contrary views to those they are now endeavouring to promulgate, might bring down upon me, I doubt, the double charge of presumption and conceit. And yet it is, I feel sure, from neither presumption nor conceit that I venture to forward this paper for publication in the Transactions of our Association, but simply from a desire to place on record cases which certainly must give rise to much reflection, and cause us to pause before accepting as proven facts those explanations as to the localization of certain cerebral functions which have recently been presented to us by such men as Broca, Fritsch, Hitzig, Ferrier, Hughlings Jackson, and others.

However numerous, however admirable may have been the advances accomplished in the diagnosis of the several varieties of brain disease,—however successful may have been the art of the physician in tracing, with precision, some morbid conditions of the

organ to the state of parts remote from the organ itself,—we are, nevertheless, ever and anon startled out of our propriety, and rendered sceptical as to the correctness of our knowledge, by the occurrence of cases which, apparently, give the most unequivocal contradiction to much we have been taught to think true, with regard to the functions proper to the organ, and the anatomical conditions on which the correct performance of such functions are considered to depend.

It is *not* that we can predicate, with unerring positiveness, that the division or separation of certain cerebral continuities will, inevitably, prevent the functional performance of certain special senses,—it is *not* that we have proof of life itself being extinguished by the severance of the cephalic mass from the spinal cord,—but it is the harmonious adaptation of particular psychical processes, (resulting, it may be said, from definite anatomical formations, *e.g.*, mind as connected with matter,) and the determinate effect of these in leading to muscular movements co-ordinately accomplished, that must and does irresistibly attract, and as irresistibly rivet, our attention; so much so indeed, that efforts have continually been made, and are, at this very time, being perseveringly carried on, to make out, to unravel, that great, that hitherto unrevealed, and probably for ever unrevealable secret, the origin, the alliance of immaterial mind with corporate matter.

The seeming futility, the evidently unsatisfactory character, as far as results are concerned, of all that has as yet been attempted in this direction, seems only to stimulate aspiring minds to greater, or, at any rate, to more specious labour; and hence it is, I suppose, that we are now witnessing what I cannot help but think will prove to be "talent thrown away" in vain imaginings as to the seat, or precise locality, of particular mental operations, and the influence these effect in the production of peculiar, and accurately performed, volitional muscular movements, adapted to accomplish certain desired results.

Before proceeding to make any further observations, I wish it to be clearly understood that the *immediate* object of this paper is not to attempt the refutation of any of the views that are now being advocated on this subject, neither is it intended to call into question the propriety of introducing new terms, such as *agraphia* and *aphasia*, to indicate two long-since recognised and well known conditions; but rather to relate certain clinical facts, some of which have come within my own immediate knowledge, leaving my

readers to draw such inferences as a faithful narrative of cases will, I venture to hope, fully enable them to do.

It does not appear to me that the experiments of Fritsch and Hitzig, showing that definite groups of muscles can be made to contract, in dogs, by passing galvanic currents through, or along, certain superficial portions of the anterior regions of the brain, are worthy of all the importance that has been attached to them:—first, because the excitant applied is, in itself, an abnormal one; secondly, because the conditions under which it is applied are abnormal; thirdly, because the same excitant, applied to the region in which those muscles are situated, would be followed by identically the same results; fourthly, because a loss of the substance of the very spot indicated as being the locality in which the function or faculty resides, does not always result in loss of movement, or any special loss; and fifthly, because the devised experiments afford illustrations of *pathological*, and NOT *physiological*, effects.

Of course I am not unaware of the arguments (shall I call them speculations?) brought forward by Dr. Hughlings Jackson and others upon this matter. I know that Dr. H. Jackson has said, with regard to these experiments and those of Dr. Ferrier, that in his opinion "there is no other way of finding out what movements parts of the convolutions near to the corpus striatum represent;" and he gives as his reason for so thinking, "that the other process of experimentation, that by destruction of small parts of the cerebral hemisphere, produces no obvious loss of movement." In short, Dr. Jackson, whilst admitting that the thing appears, to use his own words, "a paradox," still endeavours to prove, by *speculation*, that although the movements will take place even when the parts in which the function is believed to reside are destroyed, yet, in spite of, or rather notwithstanding this, these parts *do* represent the special movements referred to, thus making it appear that the movements can take place either with or without this portion of cerebral substance, or, in other words, that these particular anatomical conditions are, for the purpose in question, *supernumerary*. Such a line of argument unavoidably calls to mind the remark, made during a presidential address at one of the metropolitan medical societies, to the effect that if the speaker had to make a man, he would make him without tonsil glands!

I am also aware that the same style of speculative thought induces Dr. Ferrier to say most people are "*left-brained*," leaving us to conclude that there are but comparatively few "*right-minded*

persons," and, indeed, in this he is not improbably correct; but really when it is put forward *seriously*, if not in word, at any rate by inference, that we can, at will, educate whichever side of the brain we wish, it is not surprising if thoughtful practitioners and those not endowed with intensely active imaginations, begin to pause and ask themselves, and others, where opinions so extremely hypothetical, so hopelessly incapable of proof, are likely to *end*, and what practical facts they are capable of *establishing ?*

Prior to presenting a detailed account of the cases I shall offer for consideration, I trust to be pardoned for making reference to some authorities who seem, in years gone by, to have anticipated not a few, at least, of the theories with which the medical press has, of late, been so freely inundated; theories put forward with transcendental ability, and claiming, I imagine, to be original conceptions. In venturing to do this I cannot help being reminded, in the first place, of the saying of a learned man, Harris, who in his "*Philosophical Arrangements*," page 3, says, "That what from its antiquity is but little known, has, from that very circumstance, the recommendation of novelty."

The truth contained in this saying is indeed indisputable, for how frequently do we find it necessary to regret that those who favour the reading medical public with their particular views on particular subjects, have not searched the writings of medical authorities, ancient as well as modern, on kindred topics, before attaching to their views and opinions the importance of originality; this being a proceeding which, had they adopted it, must assuredly have led to the saving of much ink and paper, as well as to the avoidance of trouble untold and untellable.

A perusal of Galen's work, "*On the Use of the Parts*," must convince any one that not a few of the so-called discoveries of more modern days were foreshadowed in these seventeen books, and that even the supposed discoveries of the most recent period are little more than a *rechauffé* of this great medical philosopher's ideas.

Whilst the Galenical anatomy of the brain may raise a smile on the faces of our present cultivators of anatomical science, from its simple division of the organ into two parts, the cerebrum and the cerebellum,—the first being, he says, "of a soft nature and giving rise to the nerves of sensation, and the latter being hard and giving origin to the nerves of motion,"—yet, even with the portion of error mixed up with this theory, he was enabled to classify the nerves supplying the face, the tongue, the neck, as well as the organs of

respiration and nutrition, with a discriminating preciseness, which must strike with wonder even those who are least disposed to allow *any* exactness of knowledge upon this subject to such authors as wrote upon it in Galen's time.

But however brief and unsatisfactory may appear, to modern thought, Galen's description of the brain, it stood its ground, and served its purpose, until the labours of such minute anatomists as Reil, Malacarna, Tiedeman, and others working in the same direction, added to, and extended our knowledge of its intimate structure; but even before, indeed long before, the time of these labourers in this particular field, even so early as before the seventh century, "Theophilus Protospatharius"—who may be called one of Galen's commentators—made a wide step in advance as to the localization of certain cerebral faculties, and, in so doing, strangely enough enunciated views marvellously resembling those advocated by the most scientific physio-phrenological writers of our own time.

In the work of Theophilus, entitled, "*On the Construction of the Human Body*," a work which has been considered to be little else than a lengthy abstract of Galen's celebrated treatise, "*On the Use of the Parts*," he makes the following division of the cerebrum:—To the anterior portion he allots the sensorium, or receptacle of ideas ("fantasy" he terms it); to the middle portion, cogitation, reflection, or "*discursus mentis;*" whilst to the third or posterior part he apportions "*memory;*" in this last would, of course, be included the memory of words, and doubtlessly their expression by speech.

It must, however, be borne in mind that no such division, no approach to any such hypothesis as this, can be found in the works of Galen, so that, whether this mapping out of the cerebrum (a first reference to which may be found in the works of Nemesius, bishop of Emesa, in the fifth century) existed at any time during the Galenic period, that is as an accepted theory, we do not know; but here we certainly have, before the seventh century, a very clear, and singular as clear, habitation given to that faculty which several writers of our day have made out satisfactorily, *i.e.*, to their own minds, as pertaining to this indentical part of the brain, but claiming for it, it must be remembered, the novelty of being "*one-sided*," or, if not exactly this, that it is capable of being *educated* into what may appear, to some, to be an undue preference for the left hemisphere of the organ.

It is fair to state, in fact it would be unfair not to state, that these writers are good enough to allow some share of the memory of words, and the capability of their expression by speech, to the right hemisphere of thebrain, but, somehow or other, the left side, as a rule, gets the most *education*, and, as a consequence, is generally preferred, that say, by this particular faculty for its principal, if not its only, is to residence. The exponents of these views have displayed very great ability in their arguments; nothing that is plausible, nothing that is ingenious, seems to be wanting in the advocation of their theory; but I have been much struck with the fact that in the exposition of their opinions, they have been, in many ways, forestalled by Dr. Holland, in "*The Brain as a Double Organ*," and also, in part, by Dr. Wigan, in his work, "*The Duality of the Mind.*" This latter book is one which has been of late much quoted from, if not actually copied, and certainly has, so far at least, been much complimented; and yet one's mind cannot but revert to the circumstance that when this book of 460 pages first appeared, in A.D. 1844, it received from the medical press generally anything but complimentary notice, and from no critic did it receive a less complimentary or favourable analysis than it did from the writer in "*The British and Foreign Medical Review*" for July, 1845: as an example of the pleasant things said in it, I venture to quote the following sentences—"for of all the loose, ill-digested treatises that have ever come under our critical notice, we think we may fairly say that none have surpassed this. The book, however, will be found pleasant reading enough for those who think more of lively style and pointedness of expression, and well-told pretty stories, (with which it is plentifully scattered,) than of understanding the author's aim and keeping hold of the thread of his argument." Such was the verdict passed upon this book about thirty years ago, and yet the writers of to-day do not hesitate to adopt (shall I say appropriate?) many of the fundamental principles enunciated in this work. As an instance of this, one of our foremost authorities in matters of psychology offers, in "*The Lancet*" of December 5th, 1868, some observations illustrative of views which he wishes to advance, and in so doing, singularly enough writes in a strain of argument so manifestly resembling that made use of by Dr. Wigan, that one can almost imagine the same train of thought which influenced Dr. Wigan, when writing his book, must have seized upon the writer in "*The Lancet.*" Plagiarism is, in this gentleman's case, not to be thought of for an instant,

but here I give a quotation from both authors, so as to make the coincidence apparent.

Dr. Wigan says, at page 35 :—"To me it seems that the provision of two distinct and perfect brains for this object is like the provision of two eyes and two ears. In thought, as in vision and hearing, each organ may suffice to perform perfectly its appropriate functions, yet the two when in health produce only one result. We have only one sound with both ears, each of them hearing it at the same time. We see only one object with both eyes, each seeing separately at the same time. We carry on only one train of thought in both brains, each thinking it at the same time; all this, however, is contingent not only on the perfect health of the bodies, but on their due exercise and cultivation. In disorder or disease, brain, eye, and ear convey separate, distinct, conflicting ideas—one, or both, necessarily erroneous."

In the number of "*The Lancet*" I have referred to, it will be found the writer says:—"To me it appears that the action of the two halves of the brain in relation to speech should be compared to the action of the two eyes in vision. A person may see clearly with one, or with the other, or as he usually does, the sensations being simultaneous with both eyes; and so, in like manner, he may think and translate his thoughts into speech with one half of the brain, or with the other, or as he usually does, their action being simultaneous with both halves. If now it be asked how it happens that a particular lesion on the one side of the brain destroys the power of speech, the reply is, that the nuclei of the two sides are so closely connected commissurally and functionally, that damage done to the one implicates either, directly or by inhibitory action. If a person loses one eye, he can certainly see with the other, though the latter is liable to suffer sympathetically after a time; but if the optic ganglion of one eye were destroyed, the function of the other ganglion would *probably* be abolished in most cases."

After making certain allowances for the explanatory portion of the latter part of this paragraph, the very extraordinary resemblance of the ideas offered by these two writers (extending to the use of almost identically the same words at the commencement of the first sentence) must be obvious to every one, and would seem to favour the belief that any person may occasionally put forward opinions as originating with himself, but which have really been advanced by some one else at a previous time.

I now proceed with the narration of my cases.

Case I.—Richard Bridge, aged twenty-seven, a shoemaker by trade, was admitted as an in-patient at the Stafford Infirmary on July 10th, 1868. Prior to his admission he had been a patient at the Birmingham Eye Hospital, and had also been under the treatment of a medical practitioner in Stafford.

Previous History.—He said that about eighteen months prior to presenting himself at the Infirmary he found the vision of his left eye becoming imperfect, and he had occasionally, but only occasionally, some sudden attacks of pain on the left side of his head, just above the temple; his general health, however, was pretty good, and he continued to work at his trade until the sight of the left eye became so much worse as to be a matter of considerable inconvenience; the pain, too, increased in severity, and also occurred at much shorter intervals.

On the recommendation of some friends, he now went to the Birmingham Eye Hospital, and was subjected to a course of treatment, from which, he said, he did not experience any benefit as far as his vision was concerned; while the pain in his head was something worse, and his digestive organs very much out of order.

He next consulted the medical gentleman in Stafford before referred to, and after the lapse of some further time, made his appearance at the Infirmary on the date already stated.

Condition on Admission.—He complained of great pain, almost constant, on the left side of the head, just above the temple. His appetite was moderately good. Tongue foul, and the filiform papillæ looked elongated, erect, and white. His bowels were said to be constipated. Pulse 80, moderately full, and the beat regular. The urine was sufficient in quantity, high in colour, and had a specific gravity of 1·020; it afforded no trace of albumen, neither was there any deposit of lithates, but phosphates were in abundance. Heart and lung sounds, perfectly normal. Temperature in the axilla, 98·2 Fah.

He was a short man, with dark hair, dark grey eyes, and his complexion very sallow. He was quite blind with the left eye, but there was no defect of vision with the right eye.

The pupillary openings of the two eyes differed in size under the influence of light: the right iris was moderately contracted, whilst the left iris was unnaturally dilated; when exposed to a very strong artificial light, a sluggish but very slight contraction of

the left iris was perceptible, and, examined by oblique light, no clouding of the cornea, lens, or vitreous humour, could be detected in either eye.

An inspection of the left eye with the ophthalmoscope, showed the optic disc to be pale, even to positive whiteness, with its rim indistinct. The retina was clouded, and the vessels could not be clearly made out. There was no apparent "cupping of the disc," but the appearance of the whole *fundus* of the eye was shadowy, and *pale to an extreme.*

A similar examination of the right eye displayed nothing unnatural, except that, perhaps, the disc and retina appeared a little more vascular, the vessels somewhat larger, than is usually the case with healthy eyes.

Some few years before his eyesight began to fail he had syphilis, but, from his own account, it must have been in a very mild form, the secondary symptoms being very slight.

He did not show the least evidence of paralysis of any kind.

The diagnosis arrived at was, that he was labouring under some cerebral lesion; and, from the constant cephalalgia, I was disposed to consider there was a tumour on, or in, the brain on the left side.

Treatment.—His digestive organs being out of order he was, in the first instance, directed to take aperients, and a mixture containing phosphate and carbonate of soda, with infusion of gentian. After he had taken these for a few days, his tongue became much clearer, and his bowels acted regularly, the character of the evacuations being perfectly healthy.

Upon first coming into the Infirmary he was rather low spirited; but he soon became cheerful, amused himself with reading at times, and was generally lively and animated in his manners. The attacks of cephalalgia, although not so frequent as upon his first arrival, were still very severe when they did occur. He slept well, and always expressed himself as being refreshed by sleep.

He now had a blister applied behind his left ear, and iodide of potassium was prescribed for him.

To relieve the attacks of pain in the head, when they occurred, he was directed to apply the bisulphide of carbon, as recommended by the late Dr. Kennion of Harrogate. This he did, and always with the effect of affording him ease for the time.

In appearance, and in his general health, he evidently improved very much, but the condition of the left eye remained unaltered,

and the cephalalgia, although somewhat less severe and less frequent, still remained. Indeed, but for the persistence of this symptom he would have been discharged.

He continued in this improved state until an early hour on the morning of September 6th, 1868, when one of the patients, hearing him make a strange noise, went to his bed, and, finding him to be insensible, called the nurse. Subsequently the house-surgeon was summoned; this gentleman found the patient breathing stertorously, and quite unconcious; he died within a very few minutes afterwards.

Post Mortem.—The post mortem was made on the afternoon of the day of his death. There was nothing particular in his external configuration, he appeared to have been well nourished. The countenance bore the expression of suffering.

Cranium: the bones of the skull were both thick and dense; the various ridges, particularly the transverse occipital, being very prominent. The *dura mater* was very thick, and strongly adherent to the skull case; on removing the dura mater, the *arachnoid membrane* was seen to be semi-opaque, and, instead of allowing the vessels beneath it to be seen, quite obscured them from view; this condition was much more pronounced on the left than the right side. The colour it presented was a pale yellow ochre, not the faint rose colour usually observed in a healthy state. Underneath the arachnoid there was a very thin layer of yellow, pasty-looking, lymph; this extended all over the upper surface of the brain. The convolutions on the left side of the organ looked flattened; the sulci, or depressions, not being well marked.

The brain when removed weighed forty-two ounces. Upon attempting to slice the left hemisphere it was found to be so soft as to almost resemble pulp, it broke down with the slightest touch; the right hemisphere was naturally firm; and both lateral ventricles were nearly filled with dark clotted blood. The upper part of the corpus striatum on the left side was softened, and, indeed, admitted of being scraped away with the back part of the scalpel like so much thick cream. The fornix and corpus callosum were softened, and the left optic-thalamus softened and broken down. This condition of softening was, it may be said, general on the left side of the brain; and the third posterior convolution was even more disorganized than the other parts. The middle cerebral artery of this hemisphere was obliterated by an opaque, gummy-looking tumour, about the size of a filbert. Upon pressure between the fingers this

tumour seemed to be slightly elastic; but on a microscopical examination, the mass appeared to be homogeneous and structureless. I have already spoken of the pale yellow appearance which the left hemisphere presented; and the usual grey (or cortical) portion, when scraped or cut, looked of the same colour, *i.e.*, a pale yellow, throughout on this side of the brain.

The brain on the right side, although partaking, externally, somewhat of the appearance of the left side, yet upon being sliced was found to be in a nearly, if not quite, natural condition; it cut throughout with proper firmness. The *puncta vasculosa* were somewhat large and numerous, and the vessels generally seemed large and turgid. The grey matter was of its proper colour, and, comparing this side with the other half of the organ, it might be said to be in a healthy condition. A good deal of time was spent, and trouble taken, to discover if any particular vessel had given way so as to have occasioned the large quantity of coagulated blood found in the ventricles, but no such lesion was detected. In general terms, then, I think this case may be described as one of nearly complete disorganization of the whole left side of the cerebrum, unaccompanied by *any* symptom on either side of the person, beyond loss of vision of the left eye, and pain on the same side of the head. The organs contained in the abdominal and thoracic cavities were all healthy.

The next three or four cases are, I think, equally remarkable, but I will not weary the reader with their full details; a brief outline of each being sufficient for the object I have in view.

Case II.—Thomas Colclough, a miner by trade, and about thirty years old, met with the following accident on Easter Monday in the year 1857. He was trying a gun, and, from overloading, it burst; the breech was blown out, striking him about the middle of the forehead. This occurred in the neighbourhood of Walsall, South Staffordshire. A medical man was sent for, who found that the external wound was ragged, much contused, and about an inch in diameter. The frontal bone was fractured; and that part of it immediately behind the wound was deficient, as if carried away by some solid body which had passed through the bone, and which, in the opinion of the medical man in attendance, was still within the cranium. The man was perfectly conscious, and gave a distinct account of the accident, and this consciousness he constantly retained. He suffered no pain, and the only inconvenience he complained of was the sense of an immense weight in the head; to use his own words "his head felt to be a ton weight, and so heavy that he had a

difficulty in raising it from his pillow." He had not, throughout the attendance, a bad symptom; he slept well, and took whatever was allowed; and, in fact, he required no medical, and but very little surgical interference.

During the attendance, which lasted about two months, several pieces of bone came away from the wound, also a piece of wood, and a piece of iron, the latter was thought to be part of the gun-lock plate. At the end of the two months he was able to go about his usual employment. The only dressing applied to the wound was cold water and lint.

Wishing to get better wages than he got at Walsall, he walked from that place to Newcastle-on-Tyne, and, not succeeding in his object, he walked back again!

He was committed to the County Gaol at Stafford in the month of April, 1858, his sentence being "six months' hard labour." He was examined by Mr. Hughes, the surgeon to the gaol, at the time of his admission, who observed that he had a small wound on the forehead which was covered with a piece of plaster; it appeared, however, so trivial as to excite little attention and to require none.

On the 5th of June he complained of headache, and general malaise; this condition, it should be stated, was prevalent throughout the gaol, in consequence of the warmth of the weather, and some temporary deficiency in the ventilating apparatus. He continued poorly for about a week, and died somewhat suddenly with symptoms of compression.

Post Mortem.—This was made twenty-four hours after death. The whole right hemisphere of the brain was in such a state of softening that it precluded the possibility of removing it *en masse*, and right in its centre was a large abscess containing a very considerable amount of pus. On taking away the softened cerebral matter, a piece of iron was found embedded in the anterior part of the right hemisphere of the brain, and resting immediately upon the roof of the right orbital plate; it weighed nearly two ounces, and was found to be nearly the whole of the breech part of the gun. This piece of metal seemed to be contained in a cyst, the coats of which appeared to be formed, at least in part, by the pushing in of the dura mater. In that part of the frontal bone where the wound was situated, there was found a perpendicular slit, about an inch long; this was filled up by a membranous septum.

With the exception of being somewhat softer than natural, the left hemisphere of the brain seemed to be in a natural condition.

None of the man's special senses were interfered with ; there was not, at any time, the least symptom of paralysis or convulsion.

Case III.—This case also occurred in the Stafford County Gaol. William Wareham was received into prison on the 5th of November 1867. He was fifty-three years of age. He was sentenced to hard labour, and appeared to be in good health, in which state he continued until within twelve hours of his death, which took place on January 21st, 1868. The symptoms were those of apoplexy.

Post Mortem.—This was made six hours after death, and disclosed a solid cancerous mass about the size of a very large orange, occupying a large portion of the middle and third posterior convolutions of the left hemisphere of the brain ; in addition to this cancerous mass, the whole of this hemisphere seemed in a state of disintegration ; the upper part of the corpus striatum on this side was soft and broken down.

The right hemisphere was also in a softened state, and the ventricles contained a very large quantity of serum.

The dura mater was extremely dense, and strongly attached to the skull cap ; the pia mater was thick and opaque, and of a pale yellow colour.

This man had no objective or subjective phenomena indicative of brain disease.

Having given these three cases as occurring in my own neighbourhood, and within my own personal knowledge, I am tempted to refer, very hurriedly, to two others, they being, in my opinion, equally interesting and significant. One is recorded in "*The American Medical Intelligencer*" for April, 1837, and the other in "*The Lancet*" for January 26th, 1839.

The first of these was that of a boy who had the right side of the os frontis, and the anterior portion of the right parietal bone fractured by the kick of a newly shod horse. A piece of bone was driven into the right anterior lobe of the cerebrum ; this piece of bone, with about a teaspoonful of brain, was removed ; considerable sloughing and exposure of the brain subsequently ensued. At the time of the accident there was some intellectual confusion, but this only lasted two hours, at the expiration of which time the boy recovered every faculty of his mind, and these continued actively vigorous for six weeks, indeed to within an hour of his death, which took place suddenly on the forty-third day after the accident. Beyond a little irritative fever, which commenced on the sixteenth day, and lasted to the

termination of the case, there was no derangement of any particular organ. So slight, however, was this fever, that the patient was able, although forbidden, to sit up every day, walking frequently to the window, and withdrawing the blind to see the boys play in the street, indulging often in a hearty laugh at their gambols. The post mortem was made four hours after death, and the following is an account of it.

"Upon removing the cranium, the dura mater presented strong marks of inflammation over the entire arch of the head, being deeply injected in some parts, and having depositions of coagulable lymph in others. From the anterior inferior angle of the right parietal bone, in a line back to its junction with the occipital, the dura mater was disorganized in three points by ulceration. The space of the skull, previously occupied by the right anterior and middle lobes of the cerebrum, presented a perfect cavity, the hollow of which was filled with some sero-purulent matter, the lobes having been destroyed by suppuration; the third lobe was much disorganized. The left hemisphere was in a state of ramollisement down to the corpus callosum. It was so much softened that the slightest touch would remove portions; and, with the aid of a sponge, the gentleman performing the post mortem wiped away its substance to near the corpus callosum, when it began to be firmer, but presented more the appearance of a homogeneous mass than of a regular organization. The chiasm of the optic nerves, as well as their entire tract, was so soft as to yield to a slight touch with the handle of the scalpel, and the olfactory nerves were in the same condition. The cerebellum and medulla oblongata were in a physiological state. The spinal column was not examined. This boy was remarkably intelligent." The medical attendant, in his visits, held frequent conversations with him, and in all his observations could not discover the slightest derangement of his intellectual faculties; no dulness of sensibility, no obtuseness of perception, no impairment of judgment, no want of memory, and, so far as the mind was concerned, he gave no evidence of disease. His vision, audition, and voice were unimpaired.

The next case I have taken from "*The Lancet.*" It is related by Mr. W. Roberts, of Carnarvon, and I will give it in his own words. He says:—"Just seven years to this time I was sent for to attend a young man who had met with an accident in the extensive slate quarries of Mr. Ashton Smith, in this county. While stamping a rock the powder ignited, and the blast went direct to his face; both

eyeballs were shattered to pieces, the scalp on the forehead very much lacerated, and above the inner canthus of the left eye was a small hole in the os frontis, fairly through into the brain. Upon my arrival I found the person who attends the men at the quarries introducing a grooved director through the hole, and scooping the inside of the skull, bringing out some blackish sludge and a good deal of brain, both cortical and medullary part. I must confess I had no great hopes of the patient's recovery, and thinking I could do no more mischief than had already been done, being also anxious to know if the brain possessed any sensitive power, I took the director, and passed it, in a direct line, until it touched the os occipitis, and then turned it round in different parts. The young man, being quite conscious all this time, assured me it gave him no pain ; and it was only at the hole, in drawing out the instrument, that he did feel pain. It may be necessary to observe there was no pressure of the skull on any part of the brain, and no fracture with the exception of the hole in the os frontis. After dressing the wounds and giving directions as to the after treatment, I took my leave, and was not sent for again ; the patient got well without any unfavourable symptoms, and it so happened that I did not see him from that period until a few months since. The person already alluded to assured me that he repeatedly introduced the director afterwards, but it was not at my desire. From the manner in which the instrument was used at different times, I am satisfied both hemispheres of the cerebrum must have been broken down, and made a regular puddle of. Nevertheless, the young man has been in good health ever since, and not only that, but all the faculties of his mind are perfect, as well as his hearing, taste, smell, and feeling; his sight of course is destroyed. I shall content myself with merely stating the facts of this case, what I have here stated can be attested by living witnesses. The young man himself lives to tell the tale ; his name is Griffith Jones, he resides at a farm called Ty-du, within half a mile of the old inn, on the banks of the celebrated Lakes of Llanberris."

I cannot imagine that anyone will be indisposed to admit that these cases, (and it should be borne in mind that a very lengthy catalogue of similar cases might be brought forward,) illustrative as they may be considered to be of brain injury of the most serious kind, yet unattended by any of the supposed necessary symptoms usually accompanying such lesions, carry within themselves sufficient demonstrative evidence to show, that although particular morbid

conditions of the encephalon may at times be, nay, generally are, attended by the display of certain phenomena, yet that here, as elsewhere, it is necessary that the extremest care should be observed in distinguishing between mere coincidences and absolute consequences. No hasty inferences, no jumping at conclusions should be permitted. We must not allow our judgment, acknowledged as it is on all hands as being liable to err, to be led away by arguments both specious and special; arguments, many of which are used principally to maintain some particular hypothetical teachings upon a subject beset on all sides with difficulties so great that, as yet, human skill and human reason have been unable to surmount them. And, when referring to these difficulties, I mean not only such as appertain to nerve force, (whatever that force may be,) and the results effected by it volitionally or otherwise, but I indicate also that most mysterious of all speculative mysteries, the connection of mind and matter—mind influenced by matter, mind influencing matter in which is said to be situated mind itself.

As regards the recent experiments accomplished by means of vivisection, to which I have before referred, their intention has been to unravel an intricate physiological problem, a problem which has been attempted to be worked out by others in times very remote from the present; a problem which remains now, as then, unsolved: but this need not excite surprise, although it may in some manner occasion regret; for if the synthesis of disease, that is synthetical pathology, (about which the profession generally has, even now, but little knowledge,) has only been so far laboriously pursued by able hands with but a limited amount of success, surely the synthesis of life, perhaps better expressed as synthetical physiology, may well be considered as beyond the reach of human power. Perhaps, however, there may be those amongst us who see no limit to human knowledge and human skill; who believe that, because the analysis of blood, of bone, of nerve, of muscle, and the like, has been permitted, the synthesis of these, and of all that pertains to them, will not be withheld; who consider that a physical and a mental cause are but convertible terms, and that Nature has no secret she will not reveal if only questioned with determined perseverance. To such, all things may seem possible. Nevertheless to the writer, and he has no doubt to many others, Nature seems to have always had, and he believes will have to the end of time, if ever such time arrives, her *impenetralia*, and he has neither hope nor expectation that the day will ever come when human knowledge

will be able to develope, from the elements of inorganic material, organic matter endowed with the functions of *Life*. I believe "*Das Wissen wird im Suchen sich entfalten*," but I do not believe that *all* knowledge will do it.

Admitting and admiring the skill displayed by those experimentalists who have so recently bent their energies on discovering the particular locality in which resides the capability, upon physical excitation, of producing a series of co-ordinate movements, it is impossible to shut one's eyes to the fact that the objections which may be raised, both to the experiments themselves, as intended illustrations of physiological effects, and to the inferences which they would wish to have drawn from them, are both many and great, and that the whole matter is in much the same state as it has been left by other and older investigators, so that the following remarks made by Guthrie in his work "*On Injuries of the Head affecting the Brain*," are as true now as then (1842). Mr. Guthrie says, "Injuries of the head affecting the brain are difficult of distinction, doubtful in their character, treacherous in their course, and for the most part fatal in their result." And again he says, "Such are the deficiencies in our knowledge of the complicated functions of the brain, that although we think we can occasionally point out where the derangement of structure will be found, which has given rise to a particular symptom during life, the very next case may possibly show an apparently sound structure with the same derangement of function." Will the most profound pathologist, the most devoted and skilled experimentalist, of the present day, attempt to deny the truth contained in these two sentences written thirty-two years since?

Where is the great advance since the days of Hippocrates, who announced that the cause of mischief in paralysis occupied the side of the brain opposite to the paralysed limb? The progress of science has only shown us that the rule, although general, is not universal, as in some few cases the paralysis and the lesion of the brain exist on the same side, and Mr. Guthrie says (page 45) that "Burdach" has collected fifteen cases in which this took place. So again it was, at one time, positively asserted (Foville and Pinel Grandchamp) that paralysis of the upper extremity always indicated injury of the opposite optic thalamus, and that paralysis of the lower extremity was the result of some affection of the corpus striatum; yet the uncertainty attached to such signs are well known, and the facts appealed to in their support are mere coincidences

when they occur. So also with regard to Broca's theory as to localizing the faculty of speech in the third posterior convolution on the left side; the coincidence of aphasia and agraphia as descriptive of two long and well known conditions, are now no longer insisted upon as being *universally* the result of some lesion in this particular locality. The inconsequential character of the views at one time strongly advocated in this matter is now pretty generally admitted, and looking at the nature and bearing of the experiments performed by Dr. Ferrier, the necessary operations, the stimulant employed, the admission that if the particular part stimulated or excited were removed the same results would ensue,—I say that, looking at all these circumstances, can it be doubted that this theory, too, will share the fate of so many others that have been broached with regard to the physiology and pathology of the cephalic mass. Indeed in this last instance, the use of a physical excitant, in the place of a purely volitional one, seems to set at defiance a provision which should always accompany every experiment, namely, exactitude of conditions. Perhaps it will, however, be said, "Ah well, but then volition has no brain." Exactly so, and therefore no co-efficient can ever be found for it.

Speaking humbly for myself I candidly confess that the cases I have brought forward, not to mention many others that might be given, are to my thought sufficient of themselves to prove subversive of the many vain imaginings (I can find no better word) of those who profess to recognise the particular brain spots in which resides the capability of manufacturing, so to speak, our various intellectual faculties; faculties, be it remembered held to be perfectly distinct from those excito-motory and sensori-motor qualities which properly belong to what I may, perhaps, be permitted to call instinctive volitional functions. Still further, we have here cases in which some portions of the brain from which nerves of this series arise, were in a morbid condition, and the nervous apparatus, for the most part, in an unsound state and unfit for conveying impressions; whilst that part of the organ, upon the integrity of which is said to depend the correct performance of the three functions,—perception, reflection, and memory,—was almost entirely lost, and such of it as remained, in a highly pathological, or more correctly speaking, a highly morbid, condition. Yet, strange to say, all the manifestations of human intelligence were present in their usual and natural state, all volitional movement, properly performed, leading one almost to infer, if indeed in our present state of knowledge it is safe to trust

oneself with an inference on such a subject, that the encephalon is scarcely required for the highest functions!

One, at least, of the cases mentioned, seems to contradict the opinion of Sir C. Bell, viz., that disease of the general surface of the brain is always attended with derangement of the mind; and the same case is in entire opposition to the views entertained by those who contend that the seat of intellect is positioned in the periphery of the brain and its convolutions.

How, one is tempted to ask, could the functions of the mind *i.e.*, the functions of the brain according to the accepted view, be, exercised in the cases related? General intelligence was not interfered with, the moral faculties were duly exercised, and yet a large part of that portion of the brain in which we have been taught to believe the most important and complicated mental operations are created and developed, was either gone, or in a state so morbid as to be as good, or rather as bad, as gone. Truly, indeed, has it often been said, and certainly may now be said as truly as ever, "We know but little, if anything, of the true functions of the encephalon."

Some there are who are so hopeful, some there are who are so enthusiastic, as to believe, that, by extended observation and comparison of facts, a further insight will be afforded, and a comprehensive view established, as to the interdependence of mind and matter, but who will, who can, account for the connection? Let the *finite* bow before the *infinite*, and if it may not be that we can study the human body as distinct from the spiritual essence of the mind which inhabits it, yet, with a subject like this, a subject at once comprehensive and incomprehensible, it surely cannot be *unscientific* to admit, that, in the mind of man at least, the Omnipotent and Omniscient seems to have set an inscrutable limit, beyond which the subtlest intellects are rigidly precluded from carrying on their puny efforts at discovery.

A word more. If it should appear to my readers that the cases I have given go beyond the object I profess to have had in relating them, I must request that it be remembered I have only attempted to relate *facts*, facts which are irreconcilable (with our present light) with the *facts* observed and the inferences drawn by others, and that therefore, I leave them (my readers) to draw their own conclusions, and to form their own estimate of the value, if any, of observations which have simply been the "out-put" of clinical study.

Transactions of the St. Andrews Medical Graduates' Association.

1873.

1873.

GENERAL SESSION,

London, February 8.

ANNIVERSARY SESSION,

London, December 30.

GENERAL SESSION.

February 8, 1873.

The Session was held at the Freemasons' Tavern, Great Queen Street, Lincoln's Inn Fields, on Saturday, February 8th, 1873.

The President of the Association, Dr. Lockhart Robertson, took the chair.

Dr. Lyon Playfair, M.P., C.B., delivered an Address on "Universities in their relation to Professional Education."

Afterwards the Members of the Association and their friends dined together.

ANNIVERSARY SESSION.

December 30, 1873.

The Seventh Anniversary Session of the Association was held at Willis's Rooms, King Street, St. James's, on Tuesday, December 30th, 1873.

The Session commenced at 5.30 p.m.

In the absence, from illness, of the President of the Association, Dr. B. W. Richardson, F.R.S., took the chair.

The minutes of the previous Session were read and confirmed.

The Report of the Treasurer was read.

The Report of the Council was read, and, on the motion of Dr. B. W. Richardson, F.R.S., seconded by Dr. Cholmeley, was adopted.

Dr. Sedgwick proposed, and Dr. Christie seconded,—

> "That the St. Andrews Medical Graduates' Association be hereby dissolved, that the books and documents of the Association, deposited in a deed box, be given over to the charge of Dr. B. W. Richardson, F.R.S., and that he be empowered to re-organise the Association if the necessity for such re-organisation should hereafter arise."

Carried unanimously.

Dr. Moon of Brighton proposed, and Dr. Wynn Williams seconded,—

> "That the President of the Association (Dr. Lockhart Robertson,) Dr. Ballard, Dr. Cholmeley, Dr. Christie, Dr. Cleveland, Dr. Paul, Dr. B. W. Richardson, F.R.S., Dr. Seaton, Dr. Sedgwick, Dr. Wynn Williams, and Dr. Bathurst Woodman, be a Committee to wind up the affairs of the Association."

Carried unanimously.

Dr. B. W. Richardson, F.R.S., delivered an Address on the "History and Achievements of the Society."

Admiral Sir E. Belcher, K.C.B., proposed, and Dr. Davey, of Bristol, seconded, a cordial vote of thanks to Dr. Richardson for his very interesting address; an address which he had, in consequence of the illness of the President of the Association, delivered after only twelve hours' notice.

The Session was then closed, and the Association dissolved.

ANNIVERSARY DINNER.

The Anniversary Dinner was held in the evening at the same place. The President of the Association, Dr. Lockhart Robertson was in the chair during the early part of the evening, and Dr. B. W. Richardson, F.R.S., during the remainder of the time. The Right Hon. Lyon Playfair, M.P., Postmaster General; T. B. Curling, Esq., President of the Royal College of Surgeons; Professor George Johnson, M.D.; and others, honoured the Association with their presence as guests.

REPORT OF THE COUNCIL.

December 30, 1873.

Your Council in meeting you on the present occasion beg to intimate that during the past year there have not been any new Members added to the Association. Ten Candidates are however waiting at this moment for election.

During this period the Society has lost the following Members by death. Dr. J. Armstrong Purefoy Colles of Calcutta; Dr. H. J. Collett of Worthing; Dr. William Cooke of Upper Clapton, Translator and Editor of "Morgagni on Seats and Nature of Diseases"; Dr. Richard Long of Arthurstown, Wexford; Dr. H. L. Saxby of Baltasound, Shetland; and Dr. T. Browning Smith of Sittingbourne, Kent.

Your Council have great pleasure in reporting that the Mrs. Day Fund has very nearly reached the sum of £1000. The money has been invested in the names of three Trustees, Dr. Lockhart Robertson, Dr. Sieveking, and Dr. Paul. A statement of account is appended.

In regard to the proposed regulations for the Degree of M.D., your Council, having found that great objection was entertained by influential persons to the modification of the regulations as proposed by this Association, appointed a Committee, consisting of Dr. Sedgwick, Dr. Christie, and Dr. Royston, to reconsider the matter. The following Report of the Committee, presented on May 30th, 1873, was unanimously adopted by your Council.

"The Committee appointed on April 4th, 1873, by the Council of the St. Andrews Medical Graduates' Association to consider the matter of the Regulations for the Degree of M.D. of St. Andrews, and the proposed modifications, beg to report as follows:—

"The regulations for the Degree of M.D. to be observed by those candidates who had not kept terms at a University, or, in

other words, by all who sought the St. Andrews Medical Degree, restricted the number of recipients of the Degree to ten annually, and required that they should be forty years of age.

"For the reasons given in the 'Memorandum' already published, the Council of the St. Andrews Medical Graduates' Association were of opinion that these regulations pressed injuriously on many members of the profession, and requested Dr. Richardson, F.R.S., as Assessor of the General Council, to bring the matter before the University Court, and to propose such a modification of the regulations as would enable any Medical Practitioner of good repute, who had been for five years in possession of a qualification entitling him to be registered under the Medical Act, to offer himself for examination for the Degree.

"After mature consideration the University Court adopted an alteration of the regulations in this sense; and obtained the approval of the Chancellor of the University. But the consent of Her Majesty the Queen in Council was refused, on the ground that no sufficient cause had been shown for the change.

"Upon this a second 'Memorandum' embodying the views of the Association was drawn up, and a large number of members of the Medical Profession were asked to contribute their personal experience of the working of the present regulations, and their opinion of the advisability of the proposed change. 399 replies were received, of which 49 were in favour of the old regulations, 350 in favour of the proposed alteration.

"The Scotch University Commissioners in their Report of 14th May, 1863, thought it necessary, with a view of preventing any abuse of the privilege, to limit to ten, the number of Degrees which should be conferred, in accordance with the regulations in question, in any one year.

"It is submitted that a limitation in the number of Degrees granted is a very inefficient and even injurious mode of preventing an abuse of the power of granting Degrees, and that any chance of such abuse is precluded, in the case of an already qualified and respectable Medical Practitioner, by a strict, searching, and extended examination, the sufficiency and honesty of which is secured by the visitation of the Medical Council.

"The Commissioners further state that they are informed on the best professional authority that this number, ten, would be sufficient to include all persons so situated who could present any

reasonable claim for admission to a Degree. This Committee is in possession of the names of 130 duly qualified Medical Practitioners who are, at the present time, anxious to offer themselves for examination at St. Andrews; and is also cognizant of many cases of hardship suffered by Medical Men, who, to enable them to accept the office of Physician to an Hospital, need the M.D. Degree, and, by reason of the present restrictions in the number of graduates and the age of candidates, have been unable to offer themselves for examination, and so have been compelled, in some cases, to forego an honourable and indirectly valuable office, and in others, to go abroad and obtain a foreign Degree.

"These facts it may be hoped are sufficient to prove that the regulations at present in force—(*a*) exclude many Medical Practitioners, who, having commenced the study of their profession without the intention of proceeding to a University Degree, are desirous, after a successful career of some years, of attaining a higher professional position; (*b*) do not tend to the success of those best qualified, but rather to that of the earliest applicants; (*c*) are insufficient to meet the needs of the profession of Medicine; and (*d*) do not ensure the exercise of the power of granting Degrees with due regard to the best interests of the public.

"On the other hand, if a Medical Practitioner is desirous of attaining the Degree of M.D., and yet has not pursued his studies in accordance with a University curriculum, it is right and just that he should present some substitute in addition to his present qualification, which qualification may fairly be taken to represent the degree of M.B., and the substitute provided in the altered regulation adopted by the University, but rejected by the Privy Council, was the possession of his medical qualification for five years.

"After careful consideration of the matter, this Committee, in order to meet the natural susceptibilities of those who are anxious to exclude all who have no claim to the Degree, and also to satisfy the laudable desire of those who wish to become possessed of the Degree, would suggest the following modification of the ordinance:—

"'The Degree of Doctor of Medicine may be conferred by the 'University of St. Andrews on any registered Medical Practitioner, 'who shall have been for ten years in possession of a medical or 'surgical qualification entitling him to be registered under the 'Medical Act, and whose professional position and experience are

'such as in the estimation of the University to entitle him to that 'Degree, and who shall, on examination, satisfy the Medical 'Examiners of the sufficiency of his professional knowledge.'"

LEONARD W. SEDGWICK, M.D.,

30*th May*, 1873. *Chairman of Committee.*

Upon this your Council sought an interview with the Lord President of the Council, the Marquis of Ripon, who was good enough to receive them on August 1st. After hearing the arguments adduced by your Council, his Lordship promised to give the matter his best and most careful consideration.

Your Council have now to request your earnest consideration of a matter of the greatest interest to every Member; for in it is involved no less a question than the existence of the Association.

At a meeting of the General Council of the University held in the Hall of the United College at St. Andrews, on March 27th, 1873, it was resolved, *inter alia*, that a Committee of the General Council be formed in London, to watch over the interests of the University in the event of any action, either in Parliament or otherwise. The Committee to consist of the Assessor, Dr. Cleghorn, Professor Bell, and Dr. Richardson as convener, with power to assume other Members of the General Council.

This Committee is not yet completed, but when it is, it must of necessity be composed in large part of the same persons as form the St. Andrews Medical Graduates' Association; for the Doctors of Medicine constitute the greater portion of the General Council.

Appointed for the purpose of watching over the interests of the University, the London Committee of the General Council will cover the same ground as this Association, but with even wider scope.

Composed mainly of the same persons, and professing the same intent, the Committee as an integral part of the University will speak and act with greater authority than a voluntary Association having no such official status.

There are so many Medical Societies in existence, that strong reasons are needed to justify the formation of a new Association, and, when formed, to vindicate its continuance.

The exclusion of the Doctors of Medicine of St. Andrews from the General Council of their University, and the denial to them of a vote for its representative in Parliament, were ample reasons for the formation of this Association. But its success in the

accomplishment of its main objects, and the appointment of a Committee of the General Council of the University in London, have rendered the continuance of the Association no longer necessary. All the Medical Graduates are, or may be, Members of the General Council, and in that capacity they can best advance their own interests, and those of their fellow-graduates.

Your Council, impressed with these considerations, have unanimously passed the following resolution:—

> "Seeing that the chief objects for which the St. Andrews Medical Graduates' Association was founded have been accomplished, and that the University of St. Andrews has appointed a London Committee of its General Council for the furtherance of the interests of the University, this Council is of opinion that the separate existence of the St. Andrews Medical Graduates' Association is no longer necessary."

This resolution your Council now commend to your earnest consideration. The matter is in your hands for decision. Many, no doubt, will feel unwilling to destroy an organisation which has in a marked degree fulfilled its mission; but your Council believe that the prosperity of the University and its Graduates will now be best cared for by a body directly representing the University itself.

On the 28th of March last, your Council unanimously passed the following resolution:—

> "That the Council of the St. Andrews Medical Graduates' Association offer their most hearty thanks to Dr. B. W. Richardson, F.R.S., for his valuable and disinterested services as Assessor of the General Council of the University of St. Andrews during his four years' tenure of office."

Your Council cannot conclude this report without referring with sincere pleasure and satisfaction to the valuable and constant assistance and support that has been rendered to them by their esteemed friend and colleague, Dr. Leonard W. Sedgwick. To him they owe the debt of many years of sustained work, and the still greater labour of editing their "*Transactions*." For his persistent energy they record the most earnest expression of their thanks.

B. W. RICHARDSON, M.D., F.R.S., *Chairman of Council.*
W. BATHURST WOODMAN, M.D., *Hon. Secretary.*

TREASURER'S REPORT FOR 1872.

THE account of Receipts and Expenditure for the year 1872 has been audited and found correct. The following is an abstract:—

RECEIPTS.	£	s.	d.
Subscriptions of 1872	208	0	0
Arrears paid up	52	7	6
Payments in advance	8	0	0
Sale of Transactions	4	10	4
	£272	17	10

EXPENDITURE.	£	s.	d.
Deficit of 1871 paid off	40	16	0
Transactions and Postage	129	1	3
Sundry printing	11	12	6
Stationery & Stamps	12	9	3
Advertisements	1	0	6
Publisher's charges	4	17	6
Anniversary Session and Dinner	13	8	2
Silver Plate for Dr. Richardson's presentation	2	0	0
Clerk's charges	6	0	0
Photographs of Dr. Richardson	7	0	0
Postage of M.D. Memorandum	4	16	2
Sundries	0	6	8
Balance in hand	39	9	10
	£272	17	10

Examined and found correct,

THOMAS B. CROSBY, M.D.

J. H. PAUL, M.D., *Hon. Treasurer.*

THE MRS. DAY FUND.

At the time of issue of this volume the accounts of the Mrs. Day Fund had not been closed; but the following may be taken as a nearly accurate statement. The total amount subscribed, including interest on deposits, is £957. The deed of conveyance to Trustees will cost about £15; printing circulars, £23; postage, £22; advertisements, £1 15s., and sundries, £1. The sum of £748 has been invested in Bombay and Baroda Railway Stock; a further sum of about £100 will be also invested in the same way, and the remaining small balance will be handed over to Mrs. Day.

J. H. Paul, M.D., *Hon. Treasurer.*

Leonard W. Sedgwick, M.D., *Hon. Sec.*

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